WARZYN

Draft Report
Project No. 60251

Volume 3 of 5
Remedial Investigation Report
ACS NPL Site
Griffith, Indiana

Prepared for:
Steering Committee
ACS PRP Group

Prepared by:
Warzyn Inc.
Chicago, Illinois

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APPENDIX 2
Field Data Forms

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims, K Fulmer Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: B
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Typha latifolia	obl		11.		
2. Vitis vulpina	FACW-		12.		
3. Eupatorium [illegible]	FACW-		13.		
4. Salix [illegible]	FAC		14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale:

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No ✓
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No _____
Matrix Color: N 2/0 Black Mottle Colors:
Other hydric soil indicators: wet
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets chroma criteria

HYDROLOGY

Is the ground surface inundated? Yes ✓ No _____ Surface water depth: ~ 10 inches
Is the soil saturated? Yes _____ No _____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: E
Note: If a more detailed site description is necessary, use the back of data form or a field notebook

Do normal environmental conditions exist at the plant community?
Yes ✓ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus deltoides	FAC+		11.		
2. Rubus villosa (low bkberry)	None		12.		
3. Onoclea sensibilis	FACW		13.		
4. Cornus ammomum	FACW+		14.		
5. Salix exigua	OBL		15.		
6. Fraxinus virginiana	FAC-		16.		
7. Nyssa sylvatica	FACW- (wet.)		17.		
8. Lyrisdendron tulipifera	FACU+		18.		
9. Sedge spp	?		19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 85.7%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No _____
Matrix Color: N 2/0 Black Mottle Colors: _____
Other hydric soil indicators: wet
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets chroma criteria

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ___ No _____
Rationale for jurisdictional decision: _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy"

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: 6
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Cornus amomum	FACW+		11.		
2. Onoclea sensibilis	FACW		12.		
3. Salix discolor	FACW		13.		
4. Liquidambar styraciflua	FACW		14.		
5. Nyssa sylvatica	FACW-		15.		
6. Vitis vulpina	FACW		16.		
7. Rubus allegheniensis	FACU+		17.		
8. Ludwigia alternifolia	OBL		18.		
9. Spiraea alba	FACW+		19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 88%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: Pewamo loamy fine sand Subgroup:[2] typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No _____
Matrix Color: 10 YR 2/1 Black Mottle Colors: _____
Other hydric soil indicators: moist / wet
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets the chroma requirement

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: J
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Cornus amomum	FACW+		11.		
2. Salix exigua	OBL		12.		
3. Ulmus rubra	FAC		13.		
4. sedge spp.	?		14.		
5. Onoclea sensibilis	FACW		15.		
6. Fagonia virginiana	FAC-		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Miami loamy fine sand Subgroup:[2] Typic Hapludalfs
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: 10YR 2/1 Black Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets chroma criteria

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: ~ 5 inches
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS EPA State: IN County: LAKE
Applicant/Owner: Plant Community #/Name: M
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Quercus alba	FACU		11.		
2. Quercus coccinea	None		12.		
3.			13.		
4. [illegible]	FAC		14.		
5. Cornus racemosa	FAC-		15.		
6. Vitis aestivalis	FACU		16.		
7. Spirea alba	FACW+		17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 60%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale:

SOILS

Series/phase: PlainField fine sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes _____ No ✓ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No _____ Gleyed? Yes _____ No _____
Matrix Color: 10YR 3/3 Dark brown Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes _____ No ✓
Rationale:

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth:
Is the soil saturated? Yes _____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes _____ No ✓
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision:

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R Nims Date: .....
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: N
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Quercus alba	FACU		11.		
2. Quercus coccinea	none		12.		
3. Ludwigia glandulosa	obl		13.		
4. Populus tremuloides	FAC		14.		
5. Galium aparine	FACU		15.		
6. Acer rubrum	FACU		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 40%
Is the hydrophytic vegetation criterion met? Yes ____ No ✓
Rationale:

SOILS

Series/phase: Plainfield fine sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ____ Gleyed? Yes ____ No ____
Matrix Color: 7.5YR 4/6 strong brown Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale:

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ✓
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: R1
Note: If a more detailed site description is necessary, use the back of data form or a field notebook

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus deltoides	FAC+		11. Fraxinus pennsylvanica	FAC-	Common Strand
2. Prunus pensylvanica	FACU-		12.		
3. Salix exigua	-		13.		
4. Cornus stolonifera	FACW		14.		
5. Ampelopsis arborea	none		15.		
6. Rosa carolina	FAC-		16.		
7. Agrostis gigantea	none		17.		
8. Asclepias incarnata	FAC+		18.		
9. Calamagrostis canadensis	FACW		19.		
10. Sambucus canadensis	FACW-		20.		

cottonwood, cherry, willow, willows, elder, dogwood

Percent of dominant species that are OBL, FACW, and/or FAC 62.5%
Is the hydrophytic vegetation criterion met? Yes ____ No ✓
Rationale:

yes

SOILS

Series/phase: Plainfield fine sand Subgroup:[2] Typic Ud. psamments
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ____
Matrix Color: 10 YR 4/4 dark yellowish br. Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale:

no

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

no

Is the wetland hydrology criterion met? Yes ____ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy"

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: R
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus deltoides	FACW		11.		
2. P. grandidentata	FACW		12.		
3. Salix nigra	OBL		13.		
4. Cornus stolonifera	FACW		14.		
5. Sambucus canadensis	FACW		15.		
6. Onoclea sensibilis	FACW		16.		
7. Ludwigia glandulosa	OBL		17.		
8. Galium aparine	FACW		18.		
9. Cyperus esculentus	none		19.		
10. Rhus hispidus	FACW		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 77
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale: _____

SOILS

Series/phase: Maumee loamy fine Sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: 10YR 3/1 very dark gray Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meets Onsite criteria

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes _____ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: 9
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ✓ No ____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Populus tremuloides	FAC		11. ~~Fraxinus pennsylvanica~~	none	
2. Quercus palustris	FACW		12. Parthenocissus inserta	none	(VR)
3. Q. coccinea	none		13. Fragaria virginiana	FAC-	
4. Q. velutina	none		14.		
5. Rhus copallina	none		15.		
6. Cornus stolonifera	FACW		16.		
7. Amelanchier arborea	none		17.		
8. Salix nigra	obl		18.		
9. Cirsium spinosissimum	FACW		19.		
10. Rhus radicans	none		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ____ No ____
Rationale:

SOILS

Series/phase: Plainfield fine Sand Subgroup:[2] Typic Ud...
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined ____
Is the soil a Histosol? Yes ____ No ____ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ____ Gleyed? Yes ____ No ____
Matrix Color: 10YR 5/8 Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No ✓
Rationale:

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____.
Rationale for jurisdictional decision:

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS EPA State: IN County: LAKE
Applicant/Owner: Plant Community #/Name: 4
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ____ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Riccocarpus natans	none		11.		
2. Leersia fluitans	none		12.		
3. Galium aparine	FACU		(common reed eliminated)		
4. Typha latifolia	obl		14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 black Mottle Colors:
Other hydric soil indicators: unable to get actual samples, in standing water
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets Chroma requirement

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: 6in - 12 inches
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision.

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: V
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Typha angustifolia (narrowleaf cattail)	obl		11.		
2.			12.		
3.			13.		
4.			14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No _____ (yes)
Rationale: _____

SOILS

Series/phase: Muumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: A1 2/0 black Mottle Colors: _____
Other hydric soil indicators: under water (yes)
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: meet dracono criteria (yes)

HYDROLOGY

Is the ground surface inundated? Yes ✓ No _____ Surface water depth: 6-15 inches
Is the soil saturated? Yes _____ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____ (yes)
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): L. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: W
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ____ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ✓ No ____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Carex sp.	FACW		11.		
2. Thelypteris palustris	FACW		12.		
3. Onoclea sensibilis	FACW		13.		
4. Typha angustifolia	obl		14.		
5. Salix discolor	obl		15.		
6. Cornus amomum	FACW		16.		
7. Apocynum androsaemifolium	non-		17.		
8. Salix nigra			18.		
9. Spirea latifolia	none		19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 83.3%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Muskego loam, 0 to 2 percent slopes Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 Black Mottle Colors:
Other hydric soil indicators: Sampling point inundated
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets all criteria requirements

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: 6-8 inches
Is the soil saturated? Yes ____ No ____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____.
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy"

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: Y
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes _____ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No _____ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Salix fragilis	OBL		11. Rosa multiflora	FACU	
2. Quercus palustris	FACW		12. Hamamelis virginiana	FAC	
3. Fraxinus pennsylvanica	FACW		13.		
4. Quercus velutina	FACU		14.		
5. Betula alleghaniensis	FAC		15.		
6.			16.		
7. Typha angustifolia	OBL		17.		
8. Scirpus validus	OBL		18.		
9. Sambucus canadensis	FACW		19.		
10. Cornus stolonifera	FACW		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 70
Is the hydrophytic vegetation criterion met? Yes ✓ No _____
Rationale:

SOILS

Series/phase: Pits and Dumps Subgroup:[2] Typic hapludolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: N 2/0 Black Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: Gleyed

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth:
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes _____ No _____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date: _____
Project/Site: NGS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: C
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No _____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes _____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Fraxinus pennsylvanica	FACW	_____	11. _____	_____	_____
2. Acer saccharinum	FACW	_____	12. _____	_____	_____
3. Acer rubrum	FAC	_____	13. _____	_____	_____
4. Toxicodendron radicans	FAC	_____	14. _____	_____	_____
5. Quercus coccinea	NOL	_____	15. _____	_____	_____
6. Quercus alba	FACU	_____	16. _____	_____	_____
7. Quercus rubra	FACU	_____	17. _____	_____	_____
8. Betula alleghaniensis	FACU	_____	18. _____	_____	_____
9. _____	_____	_____	19. _____	_____	_____
10. _____	_____	_____	20. _____	_____	_____

Percent of dominant species that are OBL, FACW, and/or FAC 40%
Is the hydrophytic vegetation criterion met? Yes _____ No _____
Rationale: _____

SOILS

Series/phase: Maumee [illegible] sand Subgroup:[2] Typic Hapludolls
Is the soil on the hydric soils list? Yes ✓ No _____ Undetermined _____
Is the soil a Histosol? Yes _____ No ✓ Histic epipedon present? Yes _____ No _____
Is the soil: Mottled? Yes _____ No ✓ Gleyed? Yes _____ No ✓
Matrix Color: N 2/0 Black Mottle Colors: _____
Other hydric soil indicators: _____
Is the hydric soil criterion met? Yes ✓ No _____
Rationale: _____

HYDROLOGY

Is the ground surface inundated? Yes _____ No ✓ Surface water depth: _____
Is the soil saturated? Yes ✓ No _____
Depth to free-standing water in pit/soil probe hole: _____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ✓ No _____
Rationale: _____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes _____ No _____
Rationale for jurisdictional decision: _____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: D2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Quercus borealis	none		11.		
2. Quercus velutina	none		12.		
3. Populus deltoides	FAC+		13.		
4. Hamamelis virginiana	FACU		14.		
5. Staphylea trifolia	FAC		15.		
6. Salix exigua	FACW		16.		
7. Verbascum thapsus	none		17.		
8. Vitis riparia	FACW		18.		
9. Caltha palustris	OBL		19.		
10. Dipsacus sylvestris	none		20.		

Percent of dominant species that are OBL, FACW, and/or FAC 50%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Plainfield sand Subgroup:[2] Typic Udipsamments
Is the soil on the hydric soils list? Yes ____ No ✓ Undetermined ____
Is the soil a Histosol? Yes ____ No ____ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ____ Gleyed? Yes ____ No ____
Matrix Color: 10YR 2/1 Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ____ No X
Rationale: Transected wetland/upland boundary sample point at an abandoned railroad bed

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth:
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ✓
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: E2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Ludwigia glandulosa	obl		11.		
2. Galium aparinoides	FACW		12.		
3. Rosa multiflora	FACU		13.		
4. Salix eriocephala	FACW		14.		
5. Scirpus cyperinus	FAC-		15.		
6. Xanthium strumarium	FAC		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

Percent of dominant species that are OBL, FACW, and/or FAC 60%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale: ____

SOILS

Series/phase: Niawasee loamy fine sand Subgroup:[2] Typic Haplaquepts
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: ____ Mottle Colors: ____
Other hydric soil indicators: ____
Is the hydric soil criterion met? Yes ____ No ✓
Rationale: unable to obtain soil sample - sampling point on railroad embankment bordering ditch and P/EM1/SS area

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth: ____
Is the soil saturated? Yes ____ No ✓
Depth to free-standing water in pit/soil probe hole: ____
List other field evidence of surface inundation or soil saturation.

Is the wetland hydrology criterion met? Yes ____ No ✓
Rationale: ____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision ____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: H2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ___ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ___ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Viburnum prunifolium	FACU		11.		
2. Rubus canadensis			12.		
3. Ludwigia glandulosa	obl		13.		
4. Stenanthium gramineum	FAC		14.		
5. Corylus americana	FACU		15.		
6. Sonchus arvensis	FAC-		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

lack haw
[illegible] blackberry
[illegible]
[illegible]
[illegible]
sow thistle

Percent of dominant species that are OBL, FACW, and/or FAC 40%
n o Is the hydrophytic vegetation criterion met? Yes ___ No ✓
Rationale:

SOILS

Series/phase: [illegible] Subgroup:[2] [illegible]
Is the soil on the hydric soils list? Yes ___ No ✓ Undetermined ___
Is the soil a Histosol? Yes ___ No ✓ Histic epipedon present? Yes ___ No ___
Is the soil: Mottled? Yes ___ No ✓ Gleyed? Yes ___ No ✓
Matrix Color: Mottle Colors:
Other hydric soil indicators:
n o Is the hydric soil criterion met? Yes ___ No ✓
Rationale: Unable to obtain soil sample - wetland [illegible] of a ditch beside the railroad embankment, too many rocks

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Surface water depth: 4.5 feet
Is the soil saturated? Yes ___ No ✓
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

n o Is the wetland hydrology criterion met? Yes ___ No ✓
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ___ No ✓
Rationale for jurisdictional decision: [illegible] however 2 [illegible] feet SE [illegible]

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R. Nims Date:
Project/Site: ACS EPA State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: Q2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

VEGETATION

Dominant Plant Species	Indicator Status	Stratum	Dominant Plant Species	Indicator Status	Stratum
1. Calamagrostis canadensis	FACW		11.		
2. Onoclea sensibilis	obl		12.		
3. Solidago altissima	FACU		13.		
4. Dipsacus sylvestris	more FAC		14.		
5. Populus tremuloides	FAC		15.		
6. Ulmus rubra	FAC		16.		
7.			17.		
8.			18.		
9.			19.		
10.			20		

Percent of dominant species that are OBL, FACW, and/or FAC 60%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale: ____

SOILS

Series/phase: Thawville fine sandy loam Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ____
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 Black Mottle Colors: ____
Other hydric soil indicators: ____
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: meets criteria requirements

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Surface water depth: ____
Is the soil saturated? Yes ✓ No ____
Depth to free-standing water in pit/soil probe hole: ____
List other field evidence of surface inundation or soil saturation: ____
Is the wetland hydrology criterion met? Yes ✓ No
Rationale: ____

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision: ____

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

B-2

DATA FORM
ROUTINE ONSITE DETERMINATION METHOD[1]

Field Investigator(s): R Nims Date:
Project/Site: ACS State: IN County: LAKE
Applicant/Owner: EPA Plant Community #/Name: N 2
Note: If a more detailed site description is necessary, use the back of data form or a field notebook.

Do normal environmental conditions exist at the plant community?
Yes ____ No ____ (If no, explain on back)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes ____ No ____ (If yes, explain on back)

VEGETATION

	Dominant Plant Species	Indicator Status	Stratum		Dominant Plant Species	Indicator Status	Stratum
Quaking Aspen	1. Populus tremuloides	FAC		11.			
swamp dogwood	2. Cornus amomum	obl		12.			
blk willow	3. Salix nigra	obl		13.			
sandbar willow	4. Salix exigua	obl		14.			
feather bells	5. Stenanthium gramineum	FAC		15.			
fox grape	6. Vitis vulpina			16.			
	7.			17.			
	8.			18.			
	9.			19.			
	10.			20.			

yes

Percent of dominant species that are OBL, FACW, and/or FAC 100%
Is the hydrophytic vegetation criterion met? Yes ✓ No ____
Rationale:

SOILS

Series/phase: Maumee loamy fine sand Subgroup:[2] Typic Haplaquolls
Is the soil on the hydric soils list? Yes ✓ No ____ Undetermined ____
Is the soil a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ✓
Is the soil: Mottled? Yes ____ No ✓ Gleyed? Yes ____ No ✓
Matrix Color: N 2/0 Mottle Colors:
Other hydric soil indicators:
Is the hydric soil criterion met? Yes ✓ No ____
Rationale: unable to obtain sample - area inundated

yes

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ____ Surface water depth: 6-9 inches
Is the soil saturated? Yes ____ No ____
Depth to free-standing water in pit/soil probe hole:
List other field evidence of surface inundation or soil saturation.

yes

Is the wetland hydrology criterion met? Yes ____ No ____
Rationale:

JURISDICTIONAL DETERMINATION AND RATIONALE

Is the plant community a wetland? Yes ____ No ____
Rationale for jurisdictional decision:

[1] This data form can be used for the Hydric Soil Assessment Procedure and the Plant Community Assessment Procedure.
[2] Classification according to "Soil Taxonomy."

APPENDIX J

Tracer Research Investigation

Tracer Research Corporation

PREPARED FOR:

Warzyn Engineering Inc.
2100 Corporate Drive
Addison, Illinois 60101
(708)691-5000

SHALLOW GROUNDWATER INVESTIGATION
AMERICAN CHEMICAL SERVICE INC.
GRIFFTTH, INDIANA

APRIL 1990

SUBMITTED BY:

Karen L Suess

Tracer Research Corporation

WZEGACS.MGW
1-90-155-S

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INTRODUCTION

A shallow groundwater investigation was performed by Tracer Research Corporation (TRC) at American Chemical Service Inc. located in Griffith, Indiana. The investigation was conducted on March 26-29 and April 2, 1990 under contract to Warzyn Engineering Inc. The purpose of the investigation was to determine the extent of contamination by volatile organic compounds in the groundwater.

During the survey, a total of fifty-five groundwater samples were collected and analyzed from thirty-eight sampling locations. Samples were analyzed for volatile organic compounds from the following suite:

benzene
toluene
ethylbenzene
xylenes
total hydrocarbons (THC)

Xylenes are reported as the total of the three xylene isomers and total hydrocarbons are reported as gasoline range compounds consisting of approximately C_4-C_9 aliphatic, alicyclic and aromatic compounds.

The compounds in this suite were chosen as target compounds because of their suspected presence in the groundwater. Groundwater samples were screened on a gas chromatograph equipped with a flame ionization detector (FID).

EQUIPMENT

Tracer Research Corporation utilized a one ton Ford analytical field van that was equipped with one gas chromatograph and two Spectra Physics computing integrators. In addition, the van has two built-in gasoline powered generators that provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

GROUNDWATER SAMPLING PROCEDURES

Sampling probes consist of 7 to 14-foot lengths of 3/4 inch diameter hollow steel pipe. Groundwater samples were collected by driving the hollow probes with detachable drive points below the water table. Once at the desired depth the probe was withdrawn several inches to permit water inflow into the resulting hole. Groundwater samples were collected between the depths of 5 and 15 feet below grade. Once inserted into the ground, the above-ground end of the sampling probes were fitted with a vacuum adaptor (metal reducer) and a length of polyethylene tubing leading to a vacuum pump. A vacuum of up to 24 inches of mercury was applied to the interior of the probe and open hole for 15 to 20 minutes or until the water was drawn up the probe. The water thus accumulated was then removed by drawing a vacuum on a 1/4 inch polyethylene tube inserted down the probe to the bottom of the open hole. Loss of volatile compounds by evaporation is accordingly reduced when water is induced to flow into the very narrow hole, because it can be sampled with little exposure to air. The polyethylene tubing was only used once and then discarded to avoid any cross-contamination problems.

Groundwater samples were collected in 40 mL VOC vials that are filled to exclude any air and then capped with Teflon-lined septa caps. Water samples were analyzed by injecting headspace in the sample container created by decanting off approximately half of the liquid in the bottle. Headspace analysis is the preferred technique when a large number of water samples are to be performed daily. The method is more time efficient for the measurement of volatile organics than direct injection because there is less chance for semi-volatile and non-volatile organics to contaminate the system as there is with direct injection. Depending upon the partitioning coefficient of a given compound, the headspace analysis technique can also yield greater sensitivity than the direct injection technique. Both methods are similar in terms of precision and accuracy.

ANALYTICAL PROCEDURES

A Varian 3300 gas chromatograph, equipped with a flame ionization detector (FID), was used for the analyses. Compounds were separated on a 3' by 1/8" OD packed column with OV-101 as the stationary phase in a temperature controlled oven at 60°C. Nitrogen was used as the carrier gas.

Hydrocarbon compounds detected in the groundwater were identified by chromatographic retention time. Quantification of compounds was achieved by comparison of the detector response of the sample with the response measured for calibration standards (external standardization). Instrument calibration checks were run periodically throughout the day and system blanks were run at the beginning of the day to check for contamination in the soil gas sampling equipment. Air samples were also routinely analyzed to check for background levels in the atmosphere.

The GC was calibrated for headspace analysis by decanting 10 to 20 mL off of the known aqueous standard so as to leave approximately the same amount of headspace that was in the water headspace samples. The bottle was then resealed and shaken vigorously for 30 seconds. An analysis of the headspace in the vial determined the Response Factor (RF) which was then used to accurately estimate water concentrations.

Detection limits for the compounds of interest are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the analytical equipment. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses.

The detection limits for the selected compounds were approximately 0.1 ug/L, depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.1 ug/L). Detection limits obtained from GC analyses are calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of groundwater samples.

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.
- Probe adaptors (TRC's patented design) are used to connect the sample probe to the vacuum pump. The adaptor is designed to eliminate the possibility of exposing the sample stream to any part of the adaptor. Associated tubing connecting the adaptor to the vacuum pump is replaced periodically as needed during the job to insure cleanliness and good fit. At

the end of each day the adaptor is cleaned with soap and water and baked in the GC oven.

. Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.

. Injector port septa through which samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.

. Analytical instruments are calibrated each day by analytical standards from Chem Service, Inc. Calibration checks are also run after approximately every five sampling locations.

. Subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.

. Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled ambient air analysis.

. All sampling and subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.

APPENDIX A: CONDENSED DATA

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-26-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	<0.04	<0.1	<0.2	<0.5	<0.4
GW1-6'	26	32	38	40	140
GW1-11'	1200	94	51	53	3600
GW1-15'	990	25	<2	<5	3000
GW2-6'	68	28	20	8	160
GW2-11'	440	<2	<2	<2	600
GW2-14'	1100	17	<2	540	2100
GW3-6'	<0.2	<0.3	<0.3	<0.4	<1
GW3-11'	<0.2	<0.3	<0.3	<0.4	<1
GW3-14'	<0.2	<0.3	<0.3	<0.4	<1
AIR	2	3	<0.3	<0.4	8

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplander

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-27-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	<0.3	<0.3	<0.3	<0.5	<1
GW4-12'	61	2	<0.8	<1	84
GW5-12'	6	<0.3	<0.3	<0.5	10
GW6-5'	<0.3	0.3	<0.3	<0.5	2
GW6-10'	0.2	<0.3	<0.3	<0.5	0.8
GW6-14'	0.5	<0.3	<0.3	<0.5	1
GW7-6'	<0.3	0.3	<0.3	<0.5	0.7
AIR	<0.3	<0.3	<0.3	<0.5	<1
GW8-6'	<0.3	0.2	<0.3	<0.5	1
GW8-10'	<0.3	<0.3	<0.3	<0.5	<1
GW8-14'	<0.1	<0.2	<0.2	<0.3	<0.7
GW9-7'	6900	<6	<6	<11	8800
GW9-12'	5300	<6	<6	<11	6700
GW10-7'	27000	18000	<6	530	54000
GW10-12'	16000	13000	<32	970	34000
GW11-10'	62	<3	<3	<5	300
GW12-10'	170	<3	<3	<5	220
AIR	<0.3	<0.3	<0.3	<0.5	<1

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplander

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-28-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	0.1	0.2	<0.1	<0.2	0.5
GW13-7'	<0.1	0.2	<0.1	<0.2	0.5
GW13-13'	<0.1	0.2	<0.1	<0.2	0.5
GW14-7'	0.2	0.2	<0.1	<0.2	4
GW14-12'	1	0.1	<0.1	<0.2	4
GW15-7'	0.2	<0.1	<0.1	<0.2	0.6
GW15-12'	5200	<1	<1	<2	6200
GW16-12'	4300	<1	<1	<2	4900
AIR	<0.1	<0.1	<0.1	<0.2	<0.5
GW17-12'	<0.1	<0.1	<0.1	<0.2	<0.5
GW18-12'	0.1	<0.1	<0.1	<0.2	0.5
GW19-12'	<0.1	<0.1	<0.1	<0.2	<0.5
GW20-9'	6	<0.1	<0.1	<0.2	6
GW20-14'	200	<0.2	<0.2	<0.4	220
GW21-13'	<0.2	<0.2	<0.2	<0.4	<1
GW22-13'	780	5	<0.2	<0.4	900
GW23-13'	940	<1	<1	<2	1100
AIR	0.4	0.4	<0.1	<0.2	1

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplante

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
03-29-90
CONDENSED DATA

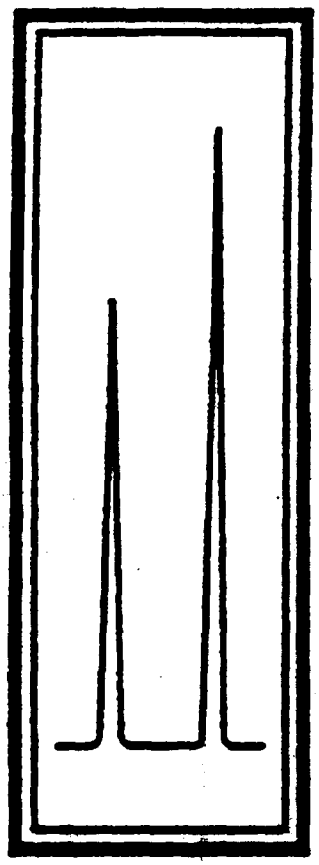
SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	0.8	1	<0.1	1	3
GW24-11'	12000	<2	<2	<4	20000
GW25-11'	<0.1	<0.1	<0.1	<0.2	<0.5
GW26-11'	1	<0.1	<0.1	<0.2	3
GW27-11'	7400	5	<1	<2	15000
GW28-11'	<0.1	<0.1	<0.1	<0.2	<0.5
AIR	<0.1	<0.1	<0.1	<0.2	<0.5

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Applander

WARZYN ENGINEERING/ACS/GRIFFITH, INDIANA JOB#1-90-155-S
04-02-90
CONDENSED DATA

SAMPLE	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	THC ug/l
AIR	<0.1	<0.2	<0.2	<0.3	<0.7
GW29-10'	<0.1	0.1	<0.2	<0.3	<0.7
GW30-10'	2	<0.2	<0.2	<0.3	2
GW31-12'	6	0.3	<0.4	<0.6	8
GW32-12'	30	<0.3	<0.4	1	210
AIR	<0.1	0.1	<0.2	<0.3	<0.7
GW33-9'	27000	7	<4	4900	37000
GW34-9'	2600	<2	<2	<3	3300
GW35-9'	3800	11000	<2	10000	23000
GW36-11'	25000	<2	<2	<3	32000
GW37-11'	7	<0.8	<0.9	<1	9
GW38-12'	8	<0.4	<0.4	<0.7	10
AIR	0.3	0.3	<0.2	<0.3	1

Analyzed by: P. Reko
Checked by: A. Hooper
Proofed by: L. Laplander



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FIELD LOGBOOK

WARZYN ENGIN. IN:

CLIENT American Chemical Services

SITE

LOCATION Griffith, IN

DATES 3-26-90

1-90-155-S

Tracer Research Corporation

VAN # 3
PLATE # 3NR 132

SOIL GAS INVESTIGATION BACKGROUND INFORMATION

SITE NAME: American Chemical Services
LOCATION: 420 S. COLFAX Ave. Griffith, IN 46319
DATES OF INVESTIGATION: 3-26-90 ↔
CLIENT NAME & ADDRESS: WARZYN ENGINEERING Inc
Chicago Ill

FIELD REPRESENTATIVE(S) FOR CLIENT: Tim Maley

PERSON TO WHOM REPORT AND QUESTIONS SHOULD BE DIRECTED: Dr. Peter Vagt
PHONE: (708) 691-3058
CREW: CHEMIST Pete Rorg GEOLOGIST ANDY Hooper

REPORT TO INCLUDE (CIRCLE):
(A.) QA/QC-PROCEDURES-DATA ONLY or
B. FULL REPORT WITH CONTOUR MAPS AND INTERPRETATION

PURPOSE OF INVESTIGATION

FIND EXTENT OF CONTAMINATION, eg locate outside edges of plume

TARGET VOCs
BTEX Total Hydrocarbons

GROUNDWATER INFORMATION: 1' to 8'
DEPTH TO WATER: ~5' variable DIRECTION: Variable

SOURCES OF CONTAMINATION
UNKNOWN

GEOLOGIC SETTING: (e.g. soil type, subsurface geology, etc.)

Fine Sand

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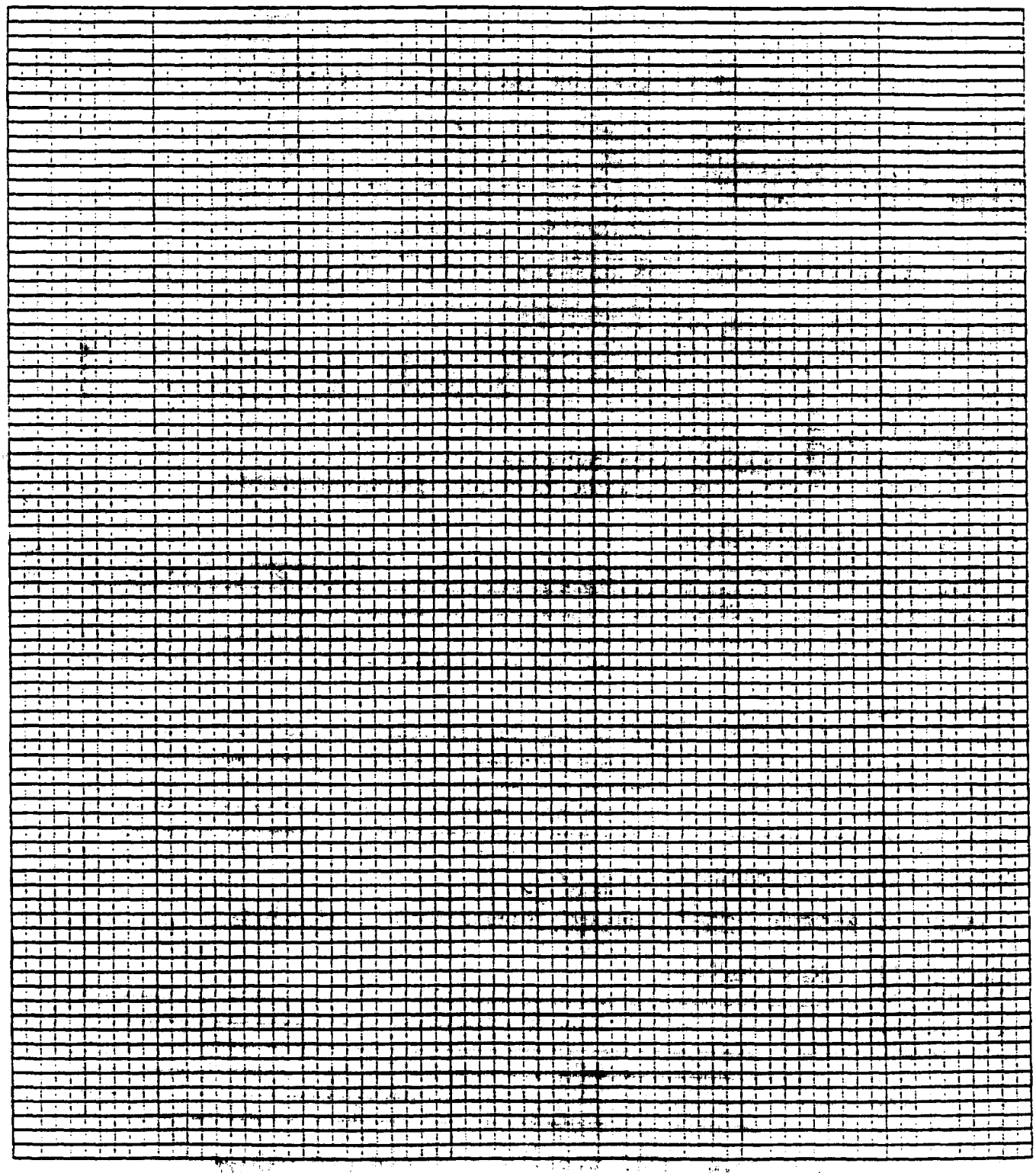
S I T E M A P



SITE MAPS TO INCLUDE: SITE NAME, SCALE, NORTH ARROW, SOIL GAS LOCATIONS & NUMBERS, CULTURAL AND NATURAL FEATURES TO IDENTIFY SITE.

Tracer Research Corporation

DATE : 3/26/90
LOCATION : Griffith, Indiana
CLIENT : WARZYN ENGINEERING

GC Operator: PETE REKO
Weather : clear, cold, windy

Field Assistant: Andy Hooper

FIELD HOURS

A Time on site : 8:00
B Time off site : ~~5:00~~ 17:00

Hours on site (B - A) : 9:00

Lunch hours : 1.0
Downtime hours[1] : —
Standby hours[2] : —

DECONTAMINATION

Probe Decontamination

Total hours: ½

Verified by GC operator

Syringe Decontamination

Total hours : ½

Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 9:30
Time end : 10:30
Total hours: 1

Sampling

Max vacuum : 26 in Hg
Probes used : 5
Points used : 7
Soil gas samples collected : 0
Water samples collected : 7

Analysis

Total system blanks : 1
Total air samples : 2

Verified by Client

Field data and gas standards checked by _____

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages
2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/26/90
LOCATION: Griffith, Ind. CLIENT: WARZYN ENG

SAMPLING DATA

TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT #	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
	TIME ON SITE: 8:00									
	BEGIN CALIBRATION: 9:30									
	AIR BLK									
11:25	GW-1	6'	A	N1	Push 6'	-	-	40 ml	1	GROUNDWATER Reddish Brown CLOUDY, Moderate particulates
12:00	GW-1	11'	B	N2	Push 11'	-	-	35 ml	1	Grayish Brown, CLOUDY, heavy particulates, hydrocarbon odor
12:40	GW-1	15'	A+ B	N3	Push 7 Pound 4'	-	-	20 ml	1	Same as at 11'
14:22	GW-2	6'	C	N4	Push 6'	-	-	30 ml	1	light brown, cloudy, few particulates no noticable odor
14:50	GW-2	11'	D	N5	Push 11'	-	-	20 ml	1	gray, cloudy, moderate part, no odor
15:30	GW-2	14'	D	N6	Push 3'	-	-	30 ml	1	Same as 11'
16:20	GW-3	11'	E	N7	Push 11'	-	-	20 ml	1	light Brown, Cloudy, few part., no

Tracer Research Corporation

DATE : 3/27/90
LOCATION : Griffith, Ind
CLIENT : WARZYN

GC Operator: PETE RECO
Weather : clear, cool

Field Assistant: Andy Hooper

FIELD HOURS

A Time on site : 8:10
B Time off site : ~~17:45~~ 18:00

Hours on site (B - A) : ~~9.6~~ 9.85

Lunch hours : 1
Downtime hours[1] : —
Standby hours[2] : —

DECONTAMINATION

Probe Decontamination

Total hours: 1/2

Peter Reco
Verified by GC operator

Syringe Decontamination

Total hours : 1/2

Andy Hooper
Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 8:15
Time end : 9:30
Total hours: 1.25

Sampling

Max vacuum : 26 in Hg
Probes used : 15
Points used : 15
Soil gas samples collected : 0
Water samples collected : 15

Analysis

Total system blanks : 1
Total air samples : 3

Verified by Client

Field data and gas standards checked by _____

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages
2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/27/90
LOCATION: Griffith, Ind CLIENT: WARZYN

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 8:10 BEGIN CALIBRATION: 8:15										
9:40	GW-4	12'	A	N_1	push 12'	-	-	30 ml	1	Grey, cloudy, HP, No odor
9:54	GW-5	12	B	N_2	push 12'	-	-	20 ml	1	Same as GW-4
10:25	GW-6	6'	C	N_3	push 6'	-	-	20 ml	1	
10:35	GW-6	10'	D	N_4	push 10'	-	-	20 ml	1	Dark Brown, cloudy, MP, NO
10:44	GW-6	14'	E	N_5	push 4'	-	-	30 ml	1	light Brown, cloudy, MP
11:30	GW-7	6'	F	N_6	push 6'	-	-	20 ml	1	light Brown, cloudy, MP
14:00	GW-8	6'	G	N_7	push 6'	-	-	20 ml	1	light Brown & cloudy, MP, NO
14:10	GW-8	10'	H	N_8	push 10	-	-	20 ml	1	Gray, cloudy, MP, NO
14:20	GW-8	14'	I	N_9	push 4'	-	-	20 ml	1	Grayish brown, cloudy, black s
15:40	GW-9	7'	J	N_{10}	push 7'	-	-	20 ml	1	Light Brown, cloudy, MP
15:55	GW-9	14'	K	N_{11}	push 4' Down 3	-	-	20 ml	1	light brown, Cloudy, MP
16:15	GW-10	7'	L	N_{12}	Push 7			20 ml	1	light brown
16:30	GW-10	14'	M	N_{13}	push 14'	-		20 ml	1	light brown
17:00	GW-11	10'	N	N_{14}	push 10'			20 ml	1	light brown

Tracer Research Corporation

DATE:
LOCATION: CLIENT:

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE:										
BEGIN CALIBRATION:										
17:15	GW-12	10'	0	N 45	PUSH 10'	-	-	20	1	Light brown

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DATE:
LOCATION:

CLIENT:

N O T E S

Stuck in mud for 20 minutes
Waited for client ½ hour (to show up)
after lunch

Tracer Research Corporation

DATE : 3/28/90
LOCATION : Griffith, Ind
CLIENT : WARZYN, GNC

GC Operator: PETE REKO Field Assistant: Andy Hooper
Weather :

FIELD HOURS

A Time on site : 8:10
B Time off site : 18:00

Hours on site (B - A) : 9.83

Lunch hours : 1
Downtime hours[1] : —
Standby hours[2] : —

DECONTAMINATION

Probe Decontamination

Total hours: .25

Verified by GC operator

Syringe Decontamination

Total hours : ½

Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 8:20
Time end : 9:10
Total hours:

Sampling

Max vacuum : 26 in Hg
Probes used : 15
Points used : 15
Soil gas samples collected : 0
Water samples collected : 15

Analysis

Total system blanks : 1
Total air samples : 3

Verified by Client

Field data and gas standards checked by _____

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages
2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/28/90
LOCATION: Griffith, Ind. CLIENT: WARZYN

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE #	ADAPT #	PROBE PUSH/POUND	VAC (in Hg)	EVAC TIME (s)	SAMPLE VOL (cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 8:10 BEGIN CALIBRATION: 8:20										
9:22	GW-13	7'	1	1	Push 7	—		20 ml	1	Dark Brown, MP
9:30	GW-13	4' 13'	2	2	Push 6	—		20 ml	1	Dark Brown, MP
~~9:50 10:20~~	GW-14	7'	3	3	Push 7	—		20 ml	1	Dark Brown, MP
10:00	GW-14	12'	4	4	Push 5	—		20	1	Dark Brown, MP
10:40	GW-15	9'	5	5	Push 7	—		20	1	Light Brown, MP
10:50	GW-15	12'	6	6	push 5	—		20	1	Dark Brown, HP, Grey Silt
11:30	GW-16	12'	7	7	push 12	—		20	1	~~Grey, Cloudy, HP, Grey Silt~~
13:40	GW-17	12'	8	8	push 8 Pound 4'	—		30 ml	1	Grey, Cloudy, HP, Grey Silt
14:00	GW-18	12'	9	9	push 8 pound 4'	—		35 ml	1	same as GW-17
~~15:00~~ 14:30	GW-19	12' 14'	10	10	push 12'	—		35 ml	1	Tan colored, slightly cloudy, No particu
15:00	GW-19	20' 9' 14'	11	11	push 9'	—		20 ml	1	Grey, HP, Grey Silt
15:10	GW-20	14'	12	12	Push 14'	—		20 ml	1	Grey, HP, Grey Silt
15:45	GW-21	13'	13	13	Push Pound 3'	—		30 ml	1	
16:10	GW-22	13'	14	14	Pound 3'	—		30 ml	1	

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DATE:
LOCATION:

CLIENT:

N O T E S

SW-1 SW-5

Tracer Research Corporation

DATE:
LOCATION: CLIENT:

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in.Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE:										
BEGIN CALIBRATION:										
5:20	GW-23	13'	15	15	Pound 13'	-	-	40mL	1	

Tracer Research Corporation

DATE : 3/29/90
LOCATION : GRIFFITH, IND
CLIENT : WARZYN

GC Operator: P. ROKO
Weather : cold & Rainy

Field Assistant: A. Hooper

FIELD HOURS

A Time on site : 8:30
B Time off site : 17:45

Hours on site (B - A) : ~~8.75~~ 9.25

Lunch hours : 1
Downtime hours[1] : —
Standby hours[2] : —

DECONTAMINATION

Probe Decontamination

Total hours: 0

Verified by GC operator

Syringe Decontamination

Total hours : 1/2

Verified by field assistant

DAILY SUMMARY

Calibration

Time start : 8:30
Time end : 9:30

Total hours: 1

Sampling

Max vacuum : 26 in Hg
Probes used : 5
Points used : 5
Soil gas samples collected : 0
Water samples collected : 5

Analysis

Total system blanks : 1
Total air samples : 2

Verified by Client

Field data and gas standards checked by _____

Data checking hours:

1 - Downtime includes time spent repairing sampling & analytic equipment; note times and explanation on following field data pages
2 - Standby includes time available for sampling but waiting for client; note times and explanation on following field data pages

Tracer Research Corporation

DATE: 3/29/90
LOCATION: GRIFFITH, IND CLIENT: WARZYN

SAMPLING DATA

TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 8:30										
BEGIN CALIBRATION: 8:30										
10:00	GW-24	11'	1	1	pound it'	—		30 ml	1	
11:15	GW-25	11'	2	2	pound it'	—		30 ml	1	
12:06	GW-26	11'	3	3	pound it	—		30 ml	1	
1[illegible]:30	GW-27	11'	4	4	pound it'			30 ml	1	
[illegible]:30	GW-28	11'	5	5	pound it'			30 ml	1	

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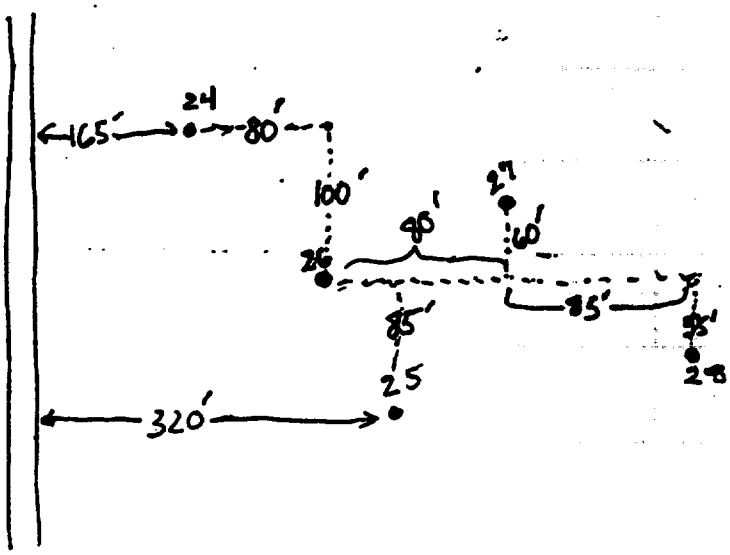
DATE:
LOCATION:

CLIENT:

N O T E S

Waited 1 hr. after lunch for client.
Stuck on train track Rail from about
3:30pm to 4:00pm



Tracer Research Corporation

DATE:
LOCATION: CLIENT:

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	Vac(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE:										
BEGIN CALIBRATION:										

Tracer Research Corporation

DATE: 4/2/90
LOCATION: Griffith, Ind. CLIENT: WARZYD Eng.

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 9 BEGIN CALIBRATION: 9:10										
10:35	GW-29	10'	1	1	push 10'	—	—	20ml	1	light Brown, MP, Dark Brown Silt No odor
10:50	GW-30	16'	2	2	push 10'	—	—	20ml	1	light Brown, same as GW-29
11:15	GW-31	12'	3	3	push 12'	—	—	20ml	1	Dark grey, HP, No odor
11:35	GW-32	12'	4	4	push 12'	—	—	30ml	1	Orange w/ orange Silt
~~13:40~~ 14:00	GW-33	9'	5	5	push 9	—	—	20ml	1	Grey w/ grey Silt
14:00	GW-34	9'	6	6	push 9	—	—	30ml	1	light brown, HP
14:30	GW-35	9'	7	7	push 9	—	—	20ml	1	
15:30	GW-36	11'	8	8	pound 11'	—	—	30ml	1	
16:00	GW-37	11'	9	9	pound 11'	—	—	30ml	1	Grey w/ Grey Silt
17:30	GW-38	12'	10	10	push 12'	—	—	30ml	1	

Tracer Research Corporation

DATE: 4/2/90
LOCATION: Griffith, Ind. CLIENT: WARZYD Eng.

SAMPLING DATA										
TIME	SAMPLE NUMBER	DEPTH	PROBE#	ADAPT#	PROBE PUSH/ POUND	VAC(in Hg)	EVAC TIME(s)	SAMPLE VOL(cc)	POINTS	NOTES/ADD'L DATA REQUESTED BY CLIENT
TIME ON SITE: 9 BEGIN CALIBRATION: 9:10										
10:35	GW-29	10'	1	1	push 10'	—	—	20ML	1	light Brown, MP, DAR Brown Silt No odor
10:50	GW-30	16'	2	2	push 10'	—	—	20ML	1	light Brown, same as GW-29
11:15	GW-31	12'	3	3	push 12'	—	—	20ML	1	Dark grey, HP, NO odor
11:35	GW-32	12'	4	4	push 12'	—	—	30ML	1	ORANGE w/ orange Silt
13:40	GW-33	9'	5	5	push 9	—	—	20ML	1	Grey w/ grey Silt
14:00	GW-34	9'	6	6	push 9	—	—	30ML	1	light brown, HP
14:30	GW-35	9'	7	7	push 9	—	—	20ML	1	
15:30	GW-36	11'	8	8	pound 11'	—	—	30ML	1	
16:00	GW-37	11'	9	9	pound 11'	—	—	30ML	1	Grey w/ Grey Silt
17:30	GW-38	12'	10	10	push 12'	—	—	30ML	1	

APPENDIX K

Field Parameter Results

TABLE
Groundwater Field Parameters
American Chemical Service NPL Site
Remedial Investigation
Griffith, Indiana

WELL #	Phase I Round I (Aug 89)	Phase II Round I (May 90)	Phase II Round II (Jul 90)
MW01			
pH	6.83		
Conductivity (umhos)	750		
Temperature (C)	17.4		
Dissolved Oxygen (mg/l)			
Red/Ox Potential (mV)			
MW02			
pH	6.74	6.90	
Conductivity (umhos)	620	710	
Temperature (C)	18.9	13.0	
Dissolved Oxygen (mg/l)			1.3
Red/Ox Potential (mV)			-36
MW03			
pH	6.14	6.54	
Conductivity (umhos)	1150	1020	
Temperature (C)	19.4	11.5	
Dissolved Oxygen (mg/l)			2.2
Red/Ox Potential (mV)			-78
MW04			
pH	6.48	6.54	
Conductivity (umhos)	1490	1600	
Temperature (C)	19.6	12.0	
Dissolved Oxygen (mg/l)			2.0
Red/Ox Potential (mV)			-40
MW05			
pH	7.04	6.58	
Conductivity (umhos)	1075	2180	
Temperature (C)	18.3	11.4	
Dissolved Oxygen (mg/l)			2.5
Red/Ox Potential (mV)			-91
MW06			
pH	6.49	6.67	
Conductivity (umhos)	1050	1580	
Temperature (C)	15.2	11.9	
Dissolved Oxygen (mg/l)			2.4
Red/Ox Potential (mV)			-25

TABLE (con't)
Groundwater Field Parameters
American Chemical Service NPL Site

WELL #	Phase I Round I (Aug 89)	Phase II Round I (May 90)	Phase II Round II (Jul 90)
MW07			
pH		7.37	8.21
Conductivity (umhos)		312	345
Temperature (C)		12.5	12.8
Dissolved Oxygen (mg/l)			1.5
Red/Ox Potential (mV)			173
MW08			
pH		6.77	7.99
Conductivity (umhos)		337	335
Temperature (C)		11.4	11.5
Dissolved Oxygen (mg/l)			2.5
Red/Ox Potential (mV)			161
MW09			
pH		6.67	7.35
Conductivity (umhos)		950	800
Temperature (C)		11.5	13.6
Dissolved Oxygen (mg/l)			3.5
Red/Ox Potential (mV)			12
MW10			
pH		7.20	7.59
Conductivity (umhos)		1750	956
Temperature (C)		11.9	14.9
Dissolved Oxygen (mg/l)			4.5
Red/Ox Potential (mV)			72
MW10C			
pH			7.10
Conductivity (umhos)			2000
Temperature (C)			14.4
Dissolved Oxygen (mg/l)			3.0
Red/Ox Potential (mV)			-38
MW11			
pH		6.83	6.91
Conductivity (umhos)		340	340
Temperature (C)		14.0	14.2
Dissolved Oxygen (mg/l)			1.8
Red/Ox Potential (mV)			78
MW12			
pH		6.78	6.68
Conductivity (umhos)		420	460
Temperature (C)		12.0	14.5
Dissolved Oxygen (mg/l)			2.1
Red/Ox Potential (mV)			17

TABLE (con't)
Groundwater Field Parameters
American Chemical Service NPL Site

WELL #	Phase I Round I (Aug 89)	Phase II Round I (May 90)	Phase II Round II (Jul 90)
MW13			
pH		7.02	7.15
Conductivity (umhos)		940	675
Temperature (C)		15.0	15.0
Dissolved Oxygen (mg/l)			2.5
Red/Ox Potential (mV)			195
MW14			
pH		6.53	6.79
Conductivity (umhos)		320	650
Temperature (C)		13.0	11.0
Dissolved Oxygen (mg/l)			4.0
Red/Ox Potential (mV)			166
MW15			
pH		7.41	7.19
Conductivity (umhos)		1830	250
Temperature (C)		14.0	17.0
Dissolved Oxygen (mg/l)			1.6
Red/Ox Potential (mV)			84
MW16			
pH		6.51	6.33
Conductivity (umhos)		5300	5000
Temperature (C)		14.0	13.5
Dissolved Oxygen (mg/l)			1.2
Red/Ox Potential (mV)			-35
MW17			
pH		6.57	6.67
Conductivity (umhos)		520	300
Temperature (C)		11.3	12.0
Dissolved Oxygen (mg/l)			3.5
Red/Ox Potential (mV)			102
MW18			
pH			6.97
Conductivity (umhos)			500
Temperature (C)			18.4
Dissolved Oxygen (mg/l)			4.8
Red/Ox Potential (mV)			256

Table

Summary of Field Parameters
American Chemical Services NPL Site
Remedial Investigation, Phase I

Landfill Leachate Field Parameters

Sample #	Date	pH	Temp (°C)	Conductivity (umhos)
LW-01-01	7/27/89	7.54	17.0	3300
LW-02-01	7/28/89	6.86	15.6	3275
LW-03-01	7/28/89	6.70	18.0	8000
LW-04-01	7/27/89	6.75	16.0	5200

Surface Water Field Parameters

Sample #	Date	pH	Temp (°C)	Conductivity (umhos)
SW01-01	7/21/89	7.32	25.1	720
SW02-01	7/21/89	7.92	25.0	68
SW05-01	7/20/89	7.34	19.0	1500
SW-07A-01	7/25/89	7.44	29.4	800
SW-08-01	7/24/89	6.26	27.1	150

Private Well Field Parameters

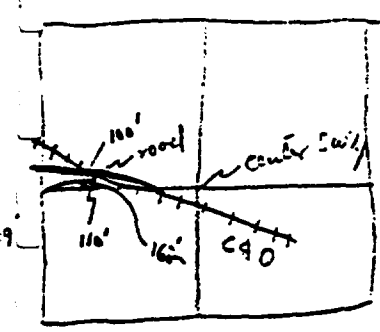
Well #	Date	pH	Temp (°C)	Conductivity (umhos)
PW01-01	6/13/90	7.44	14.3	600
PW02-01	6/13/90	7.36	14.6	750
PW03-01	6/13/90	7.43	15.0	700
PW04-01	6/13/90	7.34	13.5	625
PW05-01	6/14/90	7.34	14.4	700
PW06-01	6/14/90	7.43	14.7	1200
PW07-01	6/14/90	7.38	15.1	1100
PW08-01	6/14/90	7.42	17.9	550

Effluent Water Sample Field Parameters

Sample #	Date	pH	Temp (°C)	Conductivity (umhos)
AE01-01	11/15/89	8.72	6.1	75
AE02-01	11/15/89	8.82	7.8	52
AE03-01	11/15/89	8.77	8.4	96
AE04-01	11/15/89	8.72	9.3	99

APPENDIX L

Private Well Logs



center sec 1 - 35/9W

35/9W-1M1 (1)

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

Water sample collected S95450

WATER WELL RECORD 465575

by Ron Wass
S B H

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: St John

Congressional township: 35N Range: 9W Number of section: 1

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: one half mile east of Griffith on county road P3

1048 Reder St. Griffith

Name of owner: Slyvester Reder Address:

Name of Well Drilling Contractor: Joe Eich and Son

Address: 1601 W. 57th Gary Ind.

Name of Drilling Equipment Operator: John R. Eich

INFORMATION ON THE WELL

Completed depth of well: 55 ft. Date well was completed: May 3 1960

Diameter of outside casing or drive pipe: 2" Length: 52

Diameter of inside casing or liner: Length:

Diameter of Screen: 1" Length: 54" 4½' Slot size: 60 mesh

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Driven ☐

Static water level in completed well (Distance from ground to water level) 25 ft.

Bailer Test: Hours tested ____ Rate ____ g.p.m. Drawdown ____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown ____ ft.

Signature William E. Eich

Date June 21, 1960

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(1)

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
brown sand ✓	0	17
blue clay	17	26
fine s nd and gravel ✓	26	33
blue clay	33	39
coarse sand ✓	39	56

REMARKS:

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake TWP. 35N RGE. 9W SW¼ SW¼ NW¼ SW¼ SEC. 1

Topo. Map: [illegible] Loc. accepted w/o verification Yes — No —

El. of grnd. surface at well: 633 Courthouse Loc. ✓ By [illegible] Date 11-15-61

Depth to bedrock: _____ Field Located By Perkins Date 15&H 6/12/81

Well Log processed by: _____ Placed in Master Well Log File Date _____

100 E of W
Sec N of SL

580 -- Aquifer Elev.

GW Strategy Project - ISGH

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a ter well. We request that you be as accurate as possible in recording this information, as may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. ease include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted thin thirty days after the completion of a well to the Division of Water Resources, Indiana partment of Conservation, 311 West Washington Street, Indianapolis, Indiana.

(2)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204

Telephone 317-232-4160

596530
466660

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Ross Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner H+N Airport Address 701 E. Main St - Dyer - Ind. 46322

Building Contractor _____ Address _____

Name of Well Drilling Contractor John Fenner + Sons Well + Pump Service Inc -

Address 9703 Kennedy Avenue - Highland - Indiana 46322

Name of Drilling Equipment Operator: Everett H. Fenner

WELL INFORMATION

Depth of well: 65 ft Date well was completed: June 4-1954

Diameter of casing or drive pipe: 4" Total Length: 59 ft.

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 4" Length: 6 ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☐ For Industry ☐ For Public Supply (Bathrooms) ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☑ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

Pumping Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Arlene L. Gagliardi - Secretary

Date _____

(2)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. 35N RGE. 9W NE ¼ NW ¼ NE SEC 1 Subdivision Name

Topo Map _____

Field Located By DTK Date 7/30/86

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

1600 Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

100 Ft S of NL.

Ground Elevation 635 ~~635~~ 634

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation 570

Lot Number _____

Well is on west side of shop. / Worker verified well location.

WATER WELL LOG

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	19	Dirty Sand
19	41	Clay
43	54	Fine Sand
54	(65)	Clean Sand

Telephone 633-5267 Area Code 317

(3)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Ken Foundreys Address Main St. Griffith, Indiana

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Turner & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: Jared Turner

WELL INFORMATION

Depth of well: 63 ft. Date well was completed: Oct. 26-1971

Diameter of casing or drive pipe: 4" Total Length: 55'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 3 Length: 8 Slot Size: 06

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☒ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 17 feet

Bailer Test: Hours Tested 4 Rate 40 g.p.m. _____ Drawdown 15 ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested 4 Rate 30 g.p.m. _____ Drawdown 10 ft.

Signature Ardelmer L. Turner

Date Nov. 29-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(3)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

Keen Ferndale

COUNTY _____ TWP. 36N RGE. 4 E ¼ ____ ¼ NE SEC 2 Subdivision Name

Topo Map _____ ____ Ft W of EL. Ground Elevation _____

Field Located By _____ Date _____ ____ Ft N of SL. Depth to bedrock _____

Courthouse Location By _____ Date _____ ____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ ____ Ft S of NL. Aquifer elevation _____ Lot Number _____

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	2	Soil
2	17	Sandy Gravel
17	42	Clay & Silt
42	52	Clay
52	63	Sandy Gravel

INDIANAPOLIS 9, INDIANA

(4)

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: LAKE Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: GRIFFITH, IND.

Name of owner: KERN FOUNDRY Address: GRIFFITH, IND.

Name of Well Drilling Contractor: SHEEHY WELL + PUMP CO.

Address: RR 2 BOX 1 CEDAR LAKE, IND

Name of Drilling Equipment Operator: DOUG SHEEHY

INFORMATION ON THE WELL

Completed depth of well: 81 ft. Date well was completed: JUNE 28 1967

Diameter of outside casing or drive pipe: 8" Length: 81'

Diameter of inside casing or liner: 4" Length: 75'

Diameter of Screen: 8" Length: 29' Slot size: 0018

Type of Well: Drilled ☐ Gravel Pack ☒ Driven ☐ Other _____

Use of Well: For home ☐ For industry ☒ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☒ Rev. Rotary ☐ Jet ☐ Driven ☐

Static water level in completed well (Distance from ground to water level) 15' ft.

Bailer Test: Hours tested 2 Rate 60 g.p.m. Drawdown 15 ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 4 Rate 125 g.p.m. Drawdown 58 ft.

Signature [signature]

Date JUNE 28, 1967

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(4)

(Well Drl) does not fill out)

COUNTY: [illegible] TWP. [illegible] RGE. [illegible] ¼ ¼ ¼ SEC. 2

Topo Map: Klondike NE Loc. accepted w/o verification Yes No

Well log classified By [illegible] Date Ground elevation Ft W of EL

Yourhouse located By Date Depth to bedrock Ft N of SL

Field located By Date Bedrock elevation Ft E of WL

Placed in master well log file Date Aquifer elevation Ft S of NL

(Clay, Sand, Gravel, etc.)	From	To
Sand & Gravel (Fill)	0	5
Sand	5	25
Blue Clay	25	52
Sand (Fine)	52	81

REMARKS:

INSTRUCTIONS

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An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation.

5

INDIANAPOLIS, INDIANA

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: ____________

Congressional township: ____________ Range: ____________ Number of section: ____________

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: ____________

Name of owner: Mr. Pinkstaff Address: 743 S. Cline Av. Griffith Ind.

Name of Well Drilling Contractor: John Farmer

Address: 2830-45th St. Highland Ind.

Name of Drilling Equipment Operator: Paul Kikkert

INFORMATION ON THE WELL

Completed depth of well: 69 ft. Date well was completed: Dec. 3-1959

Diameter of outside casing or drive pipe: 2" Length: 21 ft

Diameter of inside casing or liner: ____________ Length: ____________

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other ____________

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) ________ft.

Bailer Test: Hours tested ____ Rate ____ g.p.m. Drawdown ____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown ____ ft.

Signature John Farmer - Adelma Farmer

Date Jan. 4-1960

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

NTY: Lake TWP. 35N RGE. 9W ¼ ¼ ¼ SEC. 3

o. Map: Highland 7½ Loc. accepted w/o verification Yes ___ No ___

of grnd. surface at well: ___ Courthouse Loc. By ___ Date ___
th to bedrock: ___ Field Located By ___ Date ___
l log processed by: ___ Placed in Master Well Log File Date ___

REMARKS:

INSTRUCTIONS

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As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: _____

Name of owner: Mr. Van Fleet Address: 1523 E. Elm St. Griffith

Name of Well Drilling Contractor: John Farmer

Address: 2130-45th Street

Name of Drilling Equipment Operator: Paul Kibbert

INFORMATION ON THE WELL

Completed depth of well: 50 ft. Date well was completed: Nov. 5-1959

Diameter of outside casing or drive pipe: 2" Length: 21 ft

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) _____ ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown 12 ft.

Signature John Farmer - G.I Sec

Date Nov. 14-1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

ORMATIONS (Color, type of material, hardness, etc.)	From	To

REMARKS:

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake

TWP. 36N RGE. 9W ¼ ¼ ¼ SEC. 36

Topo. Map: Highland 7½

Loc. accepted w/o verification Yes — No —

El. of grnd. surface at well: ______ Courthouse Loc. By ______ Date ______

Depth to bedrock: ______ Field Located By ______ Date ______

Well log processed by: ______ Placed in Master Well Log File Date ______

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

INDIANAPOLIS, INDIANA

(7)

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: _____

= 49 31

Name of owner: Russell Banister Address: 1525 E. Elm St Griffith Ind.

Name of Well Drilling Contractor: John Farmer

Address: 2830-45th Highland, Indiana

Name of Drilling Equipment Operator: Paul Kibbert

INFORMATION ON THE WELL

Completed depth of well: 40 ft. Date well was completed: Nov. 5-1959

Diameter of outside casing or drive pipe: 2" Length: 21 ft

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) _____ ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 1.5 g.p.m. Drawdown 8 ft.

Signature John Farmer - G.F. Lic

Date Nov. 14-1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

(7)

INTY: Lake TWP. 36N RGE. 9W ¼ ¼ ¼ SEC. 16

o. Map: Highland 7½ Loc. accepted w/o verification Yes ___ No ___

of grnd. surface at well: ___ Courthouse Loc. By ___ Date ___
th to bedrock: ___ Field Located By ___ Date ___
l Log processed by: — Placed in Master Well Log File Date ___

REMARKS:

INSTRUCTIONS

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As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

(8)

5:425
405330

WATER WELL RECORD

State Form 35680

Mail completed record within 30 days to:
DIVISION OF WATER
INDIANA DEPARTMENT OF NATURAL RESOURCES
605 STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
PHONE (317) 232-4160

Cheever Park
Griffith Cheever Park

WELL LOCATION
(Fill in completely)

nty where drilled
Lake County

Civil Township
Ross Twp

ving directions to the well location (include county road names, numbers, subdivisions, lot number with consideration to intersecting roads and trip origin (mi) There is space for a map on reverse side.

Locating Well

Co. Parks Dept. via:
229 N. Main St
Crown Point, In

OWNER — CONTRACTOR

Well owner
Lake County Parks & Recreation Dept.

Address
301 S. Colfax St Griffith - Ind. 46319

Building contractor

Address

Drilling contractor
John Farmer & Sons Well Pump Serv. Inc

Address
9703 Kennedy Ave - Highland - Ind. 46322

Equipment operator
Donald R. Farmer

Completion date
Aug. 24-1983

CONSTRUCTION DETAILS

Type of well:
☑ Drilled ☐ Gravel pack ☐ Driven ☐ Other

Use of well:
☐ Home ☐ Industry ☐ Test ☐ Irrigation
☑ Public supply ☐ Stock ☐ Other (specify) _____

Method of drilling:
☐ Cable tool ☐ Rotary ☑ Jet ☐ Rev. rotary ☐ Bucket rig

Casing length	54ft. feet	Diameter	2" inches
Screen length	4ft. feet	Diameter	1 1/4" inches
Screen slot size	.006		

Depth of pump setting

Type of pump
☐ Submersible ☐ Shallow-well jet ☐ Deep-well jet ☑ Other (specify) Hand Pump

WELL CAPACITY TEST

(Check one)
☐ Bailing ☑ Pumping

Test rate	12 gpm — 1 hrs	Drawdown	0 feet
Static level (depth to water)			3 feet

Water quality (clear, cloudy, odor, etc.)
Clear

WELL LOG

Formations: type of material	From	To
Black Dirt	0 ft.	10 ft.
Blue Clay	10	30
Fine Sand	30	38
Fine Coarse Sand	38	58

(Additional space for Well Log on reverse side)

Signed: Arlene J. Gagliardi — Secy-Treas.

Date: 2/16/84

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

County	Twp.	Rge.	¼ ¼ ¼	Sec.
Lake	35N	9W	NE ¼ NW ¼ NW	1

Topo map: Volo SW	Ft. W of EL	Ground elevation: 635	Subdivision name
Field located By: DTK Date: 7/31/86	Ft. N of SL	Depth to bedrock	Lot no.
Courthouse location By: Date:	1000 Ft. E of WL	Bedrock elevation	WWRS
Location accepted w/o verification by: Park owner and address	700 Ft. S of NL	Aquifer elevation: 578	

WELL LOG verified location.
(Continued from front side)

Formations: type of material	From	To
	ft	ft

SKETCH SHOWING LOCATION
Locate with reference to highways, intersecting county roads, and distinctive landmarks.

N

W E

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WWRS (9)

Water sample call - ted by Ron Weiss SBH

594805
464280

(24) (24)

(24) WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Anton Jose Address 1106 S. Broad Griffith Ind.

Building Contractor — Address —

Name of Well Drilling Contractor: Heda Plumbing Co.

Address Emil H. Heda

Name of Drilling Equipment Operator:

WELL INFORMATION

Depth of well: 61 Date well was completed: 7/27/71

Diameter of casing or drive pipe: 2" Total Length: 56

Diameter of liner (if used): — Total Length:

Diameter of Screen: 1¼" plastic Length: 5 ft. Slot Size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 8 feet

Bailer Test: Hours Tested — Rate — g.p.m. — Drawdown — ft.

Pumping Test: Hours Tested ½ Rate 10 g.p.m. — Drawdown — ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Emil H. Heda

Date 2/13/72

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(9)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY ______ TWP. 35N RGE. 9W NE ¼ NW ¼ NW SEC 11 Subdivision Name

Topo Map ______

Field Located By Ron Weiss Date ISBH 8/12/81

Courthouse Location By ______ Date ______

Location accepted w/o verification by ______

______ Ft W of EL.
______ Ft N of SL.
1200 Ft E of WL.
650 Ft S of NL.

Ground Elevation 630
Depth to bedrock ______
Bedrock elevation ______
Aquifer elevation 570 -
Lot Number ______

WWPS

GW STRATEGY PROJECT - ISBH

WATER WELL LOG

To	From	FORMATIONS (Color, type of material, hardness, etc.)
25	0	clay
55	25	dense 36
62	55	dirty sand
		sand

630
60
570

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weir

594660
465110

SBH

(10)

WWRS

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township St John Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner ~~Hor. Witkowski~~ Kiet Evans Address 1026- S. Abegast Street - Griffith, Ind.

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave - Highland, Indiana

Name of Drilling Equipment Operator: Jerold A. Farmer

WELL INFORMATION

Depth of well: 51' Date well was completed: Feb. 26-1973

Diameter of casing or drive pipe: 2" Total Length: 46'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 1¼" Length: 5ft Slot Size: 006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate _____ g.p.m. 12 Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate _____ g.p.m. 10 Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Secy-Treas

Signature Adelma S. Gagliardi

Date April 6-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(10)

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
Soil	0	2
Fine Sand	2	37
Blue Clay	37	46
Clean Sand	46	51

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY [illegible] TWP. 35N RGE. 9W SE ¼ NW ¼ NE SEC 11 Subdivision Name

Topo Map [illegible] 1450 Ft W of EL. Ground Elevation 630

Field Located By [illegible] Date [illegible] 8/12/81 Ft N of SL. Depth to bedrock

Courthouse Location By Date Ft E of WL. Bedrock elevation

Location accepted w/o verification by 1100 Ft S of NL. Aquifer elevation 580- Lot Number

GW SAMPLING PROJECT - ISDH

WWR

STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

(11)

WATER WELL RECORD

WELL LOCATION (Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake - Civil Township St John Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Charles Sant Angelo Address 1710 S. Arbogast St - Griffith

Building Contractor _____ Address _____

Name of Well Drilling Contractor: Joe Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave. - Highland, Indiana

Name of Drilling Equipment Operator: _____

WELL INFORMATION

Depth of well: 65 ft Date well was completed: Sept. 23-1971

Diameter of casing or drive pipe: 4" Total Length: 57

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 5" Length: 8 ft Slot Size: 06

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 15' feet

Bailer Test: Hours Tested 2 Rate 40 g.p.m. Flow Drawdown _____ ft.

Pumping Test: Hours Tested 2 Rate 12 g.p.m. Flow Drawdown _____ ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Carmen A. Inglardi

Date Oct. 7-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(11)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. _____ RGE. _____ ¼ _____ ¼ _____ SEC _____ Subdivision Name

Topo Map _____ Ft W of EL. Ground Elevation _____

Field Located By _____ Date _____ Ft N of SL. Depth to bedrock _____

Courthouse Location By _____ Date _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ Ft S of NL. Aquifer elevation _____ Lot Number _____

To	From	FORMATIONS (Color, type of material, nardness, etc.)
2	0	Silt
57	2	Clay
61	57	Sand

(12)

Water sample coll-
-ted by Ron
Jein SBH

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

WWRS

591750
463930

(26) **WATER WELL RECORD** (26)

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner John Price Address 1105 - S. Cline Ave. - Griffith - Ind.

Building Contractor Address

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 - Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: Donald Farmer

WELL INFORMATION

Depth of well: 57 ft Date well was completed: Aug. 12 - 1971

Diameter of casing or drive pipe: 2" Total Length: 52 ft

Diameter of liner (if used): Total Length:

Diameter of Screen: 1¼" Length: 5 ft Slot Size: .006

Type of Well: Drilled [x] Gravel Pack [ ] Driven [ ] Other

Use of Well: For Home [x] For Industry [ ] For Public Supply [ ] Stock [ ]

Method of Drilling: Cable Tools [ ] Rotary [ ] Rev. Rotary [ ] Jet [x] Bucket Rig [ ]

Static water level in completed well (Distance from ground to water level) 17 feet

Bailer Test: Hours Tested 2 Rate 15 g.p.m. Drawdown None ft.

Pumping Test: Hours Tested 2 Rate 10 g.p.m. Drawdown None ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adeline I. Gagliardi

Date Sept. 11 - 1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(12)

WATER WELL LOG

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. ~~36N~~ 35N RGE. 9W NW ¼ NW ¼ NW ¼ SEC 11 Subdivision Name

Topo Map

Field Located By RON VEIK Date ISBH 8/12/81

Courthouse Location By Date

Location accepted w/o verification by

Ft W of EL.

Ft N of SL.

100 Ft E of WL.

450 Ft S of NL.

Ground Elevation 633 WWRS

Depth to bedrock

Bedrock elevation

Aquifer elevation 575- Lot Number

GW STRATEGY PROJECT - ISBH

To	From	FORMATIONS (Color, type of material, hardness, etc.)
1	0	Soil
17	1	Rusty Sand
49	17	Clay
57	49	Sand
633 57	576	

Watersample collected by Ron Weiss SBH (25)

INDIANAPOLIS, INDIANA 46209
MElrose 3-6757

594700
4639115 (13)

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: St. John

Congressional township: 35N Range: 9W Number of section: 11

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: _____

Name of owner: Frank Rozek Address: 1201 S. Clair

Name of Well Drilling Contractor: _____

Address: _____

Name of Drilling Equipment Operator: Ernest Heitzberg

INFORMATION ON THE WELL

Completed depth of well: 56 ft. Date well was completed: 8/13/69

Diameter of outside casing or drive pipe: 2" Length: 52

Diameter of inside casing or liner: — Length: _____

Diameter of Screen: 1¼" plastic Length: 4ft Slot size: .006

Type of Well: Drilled [X] Gravel Pack [ ] Driven [ ] Other _____

Use of Well: For home [X] For industry [ ] For public supply [ ] Stock [ ]

Method of Drilling: Cable Tools [ ] Rotary [ ] Rev. Rotary [ ] Jet [X] Driven [ ]

Static water level in completed well (Distance from ground to water level) 10 ft.

Bailer Test: Hours tested — Rate ____ g.p.m. Drawdown ____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested ½ Rate 10 g.p.m. Drawdown — ft.

Signature Ernest Heitzberg

Date 12/3/69

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(13)

FOR ADMINISTRATIVE USE ONLY
(Well drill[er] does not fill out)

: Lake
TWP. 35N RGE. 9W SW ¼ NW ¼ NW ¼ SEC. 11

o Map: St John 7½ — Ft W of EL. Ground elevation 630
l log classified By [illegible] Date 1/20 — Ft N of SL. Depth to bedrock ____
rthouse located By ____ Date ____ 100 Ft E of WL. Bedrock elevation ____
ld located By [illegible] Date [illegible] 1000 Ft S of NL. Aquifer elevation 570-
. w/o verification By ____ Date ____

GROUND-WATER STRATEGY PROJECT - ISBH

dirty sand	0	5
sand	5	60

REMARKS:

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a ~~water well. We request that you be as accurate~~ as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water

(14)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

57545
463950

WATER WELL RECORD

WWRS

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet Twp Lisa Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER ~~and/or BUILDING~~ CONTRACTOR

Well Owner James Cooke Jr. Address 617 - S. Cline Ave - Griffith, Ind.

Building Contractor ____ Address ____

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: Jarold A. Farmer

WELL INFORMATION

Depth of well: 61 ft Date well was completed: March 3-1973

Diameter of casing or drive pipe: 2" Total Length: 56'

Diameter of liner (if used): ____ Total Length: ____

Diameter of Screen: 1 1/4" Length: 5 ft Slot Size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other ____

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) ____ feet

Bailer Test: Hours Tested 2 Rate ____ g.p.m. 12 Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate ____ g.p.m. 10 Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Ademar A. Gigliardi - Secy-Treas

Date April 6-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(14)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35N RGE. 9W SW ¼ NW ¼ SW ¼ SEC 2 Subdivision Name

Topo Map Highland

Field Located By DTK Date 7/31/86

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

Neighbor verified address location.

_____ Ft W of EL.

1500 Ft N of SL.

100 Ft E of WL.

_____ Ft S of NL.

Ground Elevation ~~683~~ 693

Depth to bedrock WWRC

Bedrock elevation 570

Aquifer elevation 569 Lot Number _____

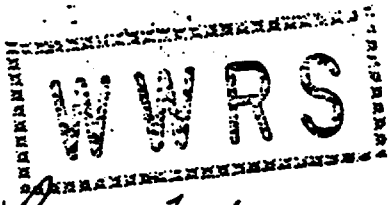
WATER WELL LOG

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	2	Soil
2	36	Medium Sand
36	44	Clean Sand
44	54	Fine Sand
54	61	Clean Sand

(15) (1)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

545225
463750



WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Ross Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

Chmielewski

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Andrew Chmielewski Address 1699 S. Cline Ave. - Griffith, Ind

Building Contractor ~~Contractor~~ Address

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service

Address 9703 - Kennedy Ave. Highland, Indiana

Name of Drilling Equipment Operator: Donald Farmer

WELL INFORMATION

Depth of well: 521' Date well was completed: June 12-1973

Diameter of casing or drive pipe: 3" Total Length: 471'

Diameter of liner (if used): Total Length:

Diameter of Screen: 1 1/2" Length: 5ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) feet

Bailer Test: Hours Tested 2 Rate 14 g.p.m. Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate 12 g.p.m. Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma I. Gugliardi

Date July 19-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(5)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35N RGE. 9W 1/4 NW 1/4 SW 1/4 SW SEC 2 Subdivision Name

Topo Map Highland 7½

Field Located By DTK Date 7/31/86

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

750 Ft N of SL.

100 Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation 578

Well Number WWRS

Original verified from survey of cross location.

WATER WELL LOG

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	2	Sand,
2	17	Sandy Sand
17	33	Fine Clay
33	47	Fine Sand
47	(52)	Clean Coarse Sand

(17)

575 150
403360

WATER WELL RECORD

State Form 35680

Mail completed record within 30 days to:
DIVISION OF WATER
INDIANA DEPARTMENT OF NATURAL RESOURCES
605 STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
PHONE (317) 232-4160

RECEIVED DEC 1984 DEPT. OF NATURAL RESOURCES DIVISION OF WATER

WELL LOCATION (Fill in completely)

County where drilled: Lake County

Civil Township: St. John Twp

Driving directions to the well location (include county road names, numbers, subdivisions, lot number with consideration to intersecting roads and trip odometer) There is space for a map on reverse side.

OWNER — CONTRACTOR

Well owner: Mr. J. Sparks

Address: 1964 So. Colfax Ave. - Griffith - Ind. 46319

Building contractor:

Address:

Drilling contractor: John Farmer & Sons Well & Pump Serv. Inc

Address: 9703 Kennedy Ave. - Highland - Ind. 46322

Equipment operator: Everett H. Farmer

Completion date: Aug. 7-1984

CONSTRUCTION DETAILS

Type of well:
☑ Drilled ☐ Gravel pack ☐ Driven ☐ Other

Use of well:
☑ Home ☐ Industry ☐ Test ☐ Irrigation
☐ Public supply ☐ Stock ☐ Other (specify) _____

Method of drilling:
☐ Cable tool ☑ Rotary ☐ Jet ☐ Rev. rotary ☐ Bucket rig

Casing length	55ft. feet	Diameter	4" inches
Screen length	8 feet	Diameter	4" inches
Screen slot size	.006		

Depth of pump setting:

Type of pump
☑ Submersible ☐ Shallow-well jet ☐ Deep-well jet ☐ Other (specify) _____

WELL CAPACITY TEST

(Check one)
☐ Bailing ☑ Pumping

Test rate: 15 gpm 1½ hrs
Drawdown: 9 feet

Static level (depth to water): 21 ft. feet

Water quality (clear, cloudy, odor, etc.)
Clear

WELL LOG

Formations: type of material	From	To
Dirty Sand	0 ft.	17 ft.
Clay	17	29
Fine Sand	29	48
Clean Sand	48	63

(Additional space for Well Log on reverse side)

Signed: Carmen A. Gaglierdi — Secy - Treas.

Date: Dec. 20-1984

5

Location accepted w/o verification by Mailbox verified location.

Ft. E of WL

Ft. S of NL

Bedrock ( )tion

Aquifer elevation 567

WWKS

mc

WELL LOG
(Continued from front side)

Formations: type of material	From	To
	ft	ft

SKETCH SHOWING LOCATION
Locate with reference to highways, intersecting county roads, and distinctive landmarks.

N

W

E

S

593125
403040

18

WATER WELL RECORD

State Form 35680

Mail completed record within 30 days to:
DIVISION OF WATER
INDIANA DEPARTMENT OF NATURAL RESOURCES
605 STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
PHONE (317) 232-4160

WELL LOCATION
(Fill in completely)

County where drilled: LAKE COUNTY

Civil Township: ST. JOHN TOWNSHIP

Driving directions to the well location (include county road names, numbers, subdivisions, lot number with consideration to intersecting roads and trip origination) There is space for a map on reverse side.

U.S. 30 TO AUSTIN AVE. N. ON AUSTIN TO GOLFVIEW DR. EAST ON GOLFVIEW DR. TO 331 GOLFVIEW

OWNER — CONTRACTOR

Well owner: DAVID + PATRICIA CHORBA

Address: 331 GOLFVIEW DR. SCHERERVILLE, IN. 46375

Building contractor:

Address:

Drilling contractor: THOMAS J. SHANLEY (463)

Address: 626 SANDI LANE SCHER. IN. 46375

Equipment operator: THOMAS J. SHANLEY

Completion date: 5-11-85

CONSTRUCTION DETAILS

Type of well:
☒ Drilled ☐ Gravel pack ☐ Driven ☐ Other

Use of well:
☐ Home ☐ Industry ☐ Test ☒ Irrigation
☐ Public supply ☐ Stock ☐ Other (specify) _____

Method of drilling:
☐ Cable tool ☒ Rotary ☐ Jet ☐ Rev.-rotary ☐ Bucket rig

Casing length	28 feet	Diameter	(PVC) 2 inches
Screen length	5 feet	Diameter	(NYLON) 1½ inches
Screen slot size	.006		

Depth of pump setting: ABOVE GROUND (IN GARAGE)

Type of pump:
☐ Submersible ☐ Shallow-well jet ☐ Deep-well jet ☒ Other (specify) F+W C6267

WELL CAPACITY TEST

(Check one)
☐ Bailing ☒ Pumping

Test rate (APPROX.) 20 gpm _____ hrs	Drawdown _____ feet
Static level (depth to water) (APPROX.) 15 feet	

Water quality (clear, cloudy, odor, etc.): CLEAR

WELL LOG

Formations: type of material	From	To
FINE SAND	0 ft.	11 ft.
CLAY	11 ft.	18 ft.
COARSE SAND	18 ft.	33 ft.

(Additional space for Well Log on reverse side)

Signed: Thomas J. Shanley (#463)

Date: 5-12-85

(18)

(Well driller does not fill in)

County	Twp.	Rge.		Sec.
Lake	35N	9W	NE ¼ SE ¼	10

Topo map: Libertyville	Ft. W of EL	Ground elevation: 660'	Subdivision name
Field located By Date	Ft. N of SL	Depth to bedrock	Lot no.
Courthouse location By Date	Ft. E of WL	Bedrock elevation	
Location accepted w/o verification by	Ft. S of NL	Aquifer elevation: 602'	

WWRS

WELL LOG

(Continued from front side)

Formations: type of material	From	To
	ft	ft

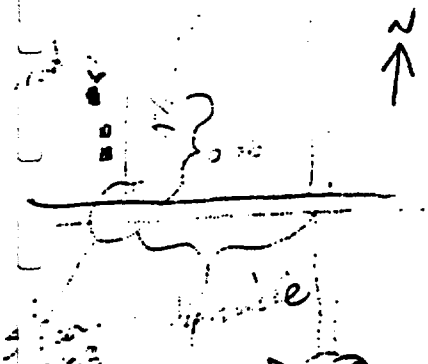
SKETCH SHOWING LOCATION

Locate with reference to highways, intersecting county roads, and distinctive landmarks.

N

W E

S



C F

35/9W - 3R1 (19)

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: LAKE Civil Township: Calumet

Congressional township: 35N Range: 9W Number of section: 3

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: 3rd House north of Co. H on McCoy Ave Griffith, Indiana. House on West side of street.

Crady

Name of owner: GUY CORDY Address:

Name of Well Drilling Contractor: Comer Drilling Co.

Address: 170 4th Cul. Expy. South Holland Ill.

Name of Drilling Equipment Operator: HOMER E. GLENN

INFORMATION ON THE WELL

Completed depth of well: 131 ft. Date well was completed: 12-9-60

Diameter of outside casing or drive pipe: 4"OD 4"ID Length: 123'

Diameter of inside casing or liner: — Length: —

Diameter of Screen: — Length: — Slot size: —

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other

Use of Well: For home ☒ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☒ Rotary ☐ Rev. Rotary ☐ Jet ☐ Driven ☐

Static water level in completed well (Distance from ground to water level) 6 ft.

Bailer Test: Hours tested 3 Rate 20 g.p.m. Drawdown NONE ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested — Rate — g.p.m. Drawdown — ft.

not home

Signature J. R. Linnell

Date 2-13-60

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(19c)

FOR ADMINISTRATIVE USE ONLY
(Well Driller does not fill out)

COUNTY: Lake TWP. ~~36N~~ 35 RGE. 9.W SE ¼ SE ¼ SE ¼ SEC. ~~27~~ 3

Topo. Map: Highland Loc. accepted w/o verification Yes ___ No ___

El. of grnd. surface at well: 628 Courthouse Loc. By ______ Date ______

Depth to bedrock: ______ Field Located By [illegible] Date 11-29-[illegible]

Well Log processed by: ______ Placed in Master Well Log File Date ______

590' NSL
200 WEL

UTM APPROX
595170
463875

WATER WELL LOG

[F]ORMATIONS (Color, type of material, hardness, etc.)	From	To
Sand Yellow	0	20
Clay	20	50
Gravel	50	60
Sand	60	74
Clay	74	89
Gravel	89	94
Hard Sand Gray	94	115
Clay	115	123
Limestone	123	131

[RE]MARKS: Drilled through the [illegible] 131' [illegible] sand [illegible] water

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a [wa]ter well. We request that you be as accurate as possible in recording these information as [it] may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. [Pl]ease include all information possible in the space provided for well locations.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted [wi]thin thirty days after the completion of a well to the Division of Water Resources, Indiana [De]partment of Conservation, 311 West Washington Street, Indianapolis, Indiana.

Telephone 633-5267 Area Code 317

(20)

WATER WELL RECORD

LL LOCATION (Fill in completely - Refer to instruction sheet)

nty in which well was drilled Lake Civil Township Calumet

riving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

ME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner _____ Address _____

uilding Contractor _____ Address _____

me of Well Drilling Contractor: _____

dress _____

ne of Drilling Equipment Operator: _____

LL INFORMATION

epth of well: 85' Date well was completed: 12-9-44

meter of casing or drive pipe: 38" Total Length: _____

Diameter of liner (if used): _____ Total Length: _____

meter of Screen: 12" Length: 20 Slot Size: _____

pe of Well: Drilled ☐ Gravel Pack ☐ Driven ☐ Other _____

se of Well: For Home ☐ For Industry ☐ For Public Supply ☐ Stock ☐

thod of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) 15' feet

ler Test: Hours Tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Drawdown is the difference between static level and water level at end of test)

mping Test: Hours Tested 1 Rate 320 g.p.m. Drawdown 30 ft.

Signature _____

Date _____

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

(28)

COUNTY Lake TWP. 36N RGE. 9W ¼ NE ¼ SW SEC. 35 Subdivision Name

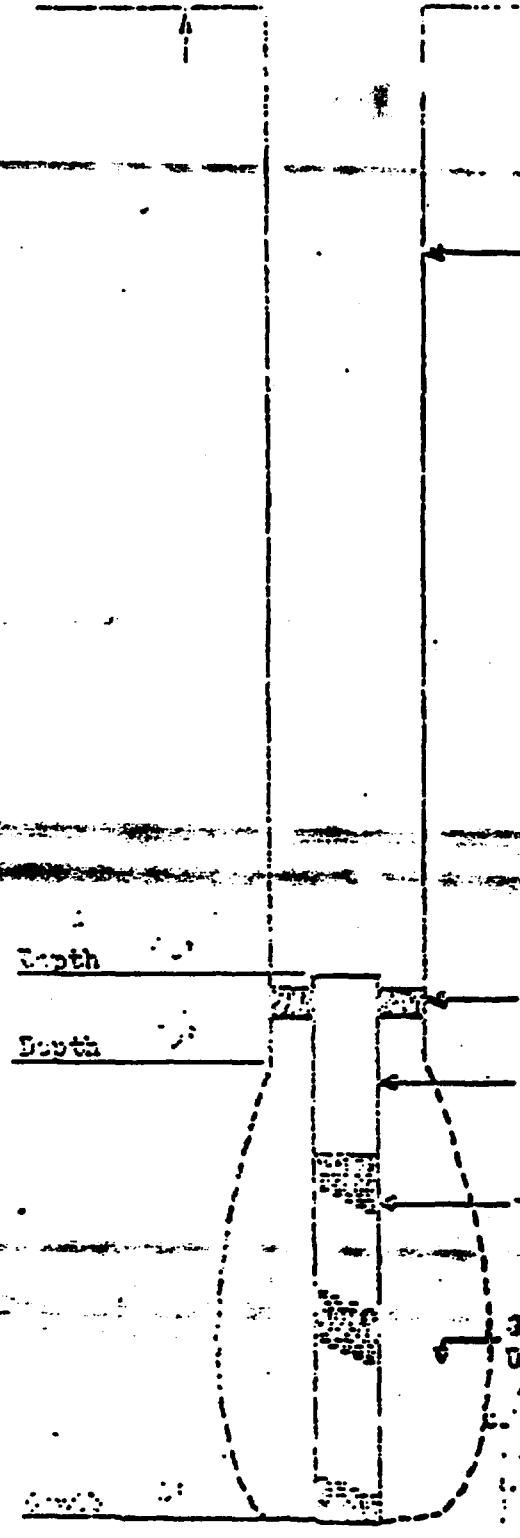
Topo Map Highland Ft W of EL. Ground Elevation 630 Lagoon - Northern

Field Located By _____ Date _____ Ft N of SL. Depth to bedrock 11-9-44

Courthouse Location By _____ Date _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ Ft S of NL. Aquifer elevation 545 Lot Number _____

From	To	Formations (color, type of material, hardness, etc.)
0	17	Sand
17	36	Medium clay
36	40	Muddy sand
40	55	Hard clay
55	62	Fine sand
62	65	Medium sand (31)
65	85	Fine sand



36N 9W SWSW

35

LAYNE GRAVEL WALL WELL
Single Cased
For

Spc 9

(21)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake Co. TWP. 36N RGE. 9W ¼ SW ¼ SW SEC 35 Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630 Lyons - Northern

Depth to bedrock _____ 8-7-46

Bedrock elevation _____

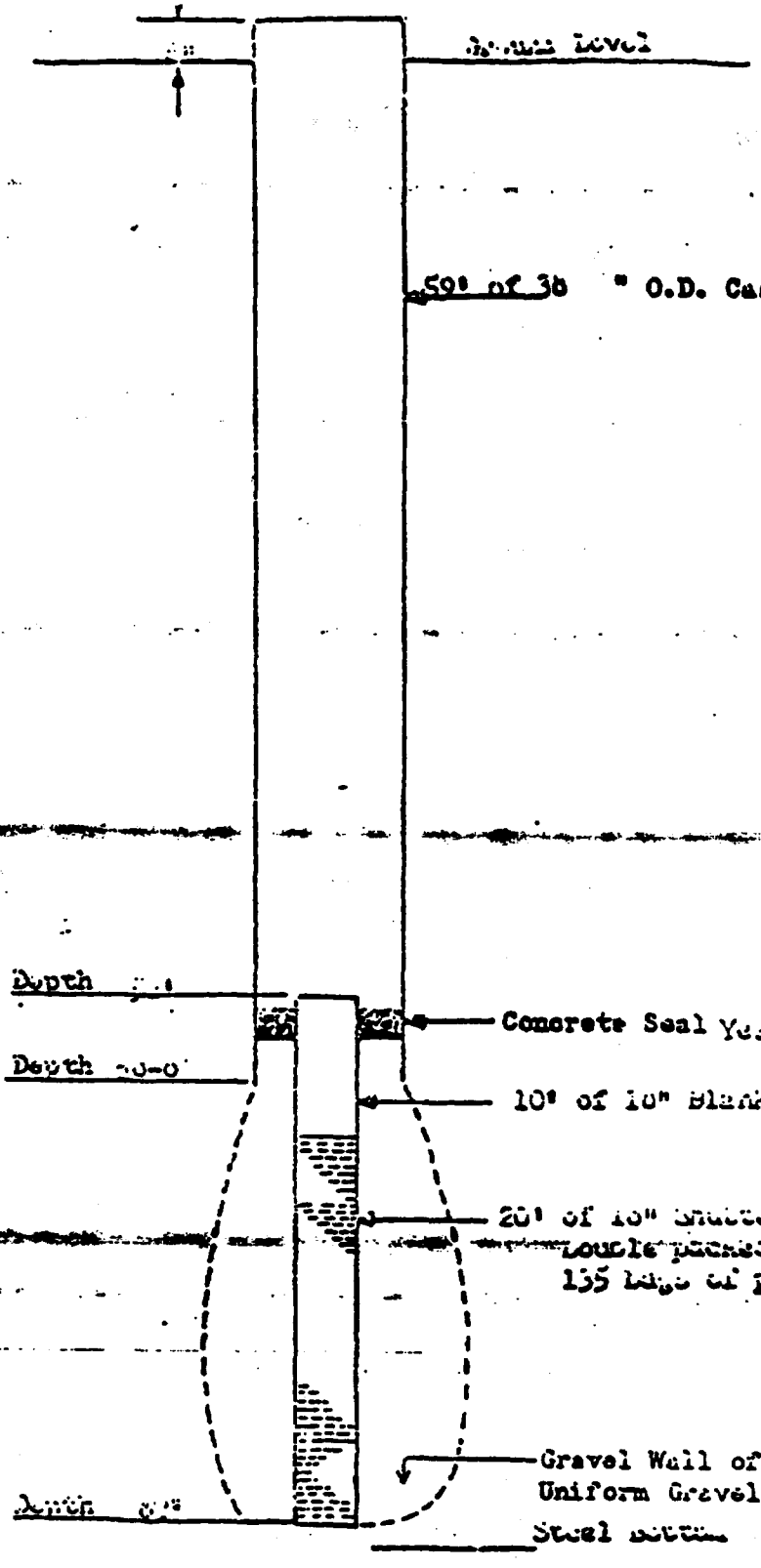
Aquifer elevation _____ Lot Number _____

0	2		Top soil
2	18		Brown sand
18	34		Clay and gravel
34	36		Fine sand
36	39		Clay
39	41		Sand
41	42		Clay
42	50		Clay and gravel
50	82		Sand

(22)

Linn County
Calumet Twp.
Section 6 Sec 35

59' of 36 " O.D. Casing



Single Casing
LAYNE GRAVEL WALL WELL No. —
For
Calumet Park District
Chicago, Ill.

Spec 10

LAYNE NORTHERN CO. INC.

22

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 36N RGE. 9W. SW ¼ SW ¼ SW SEC 35

Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation _____

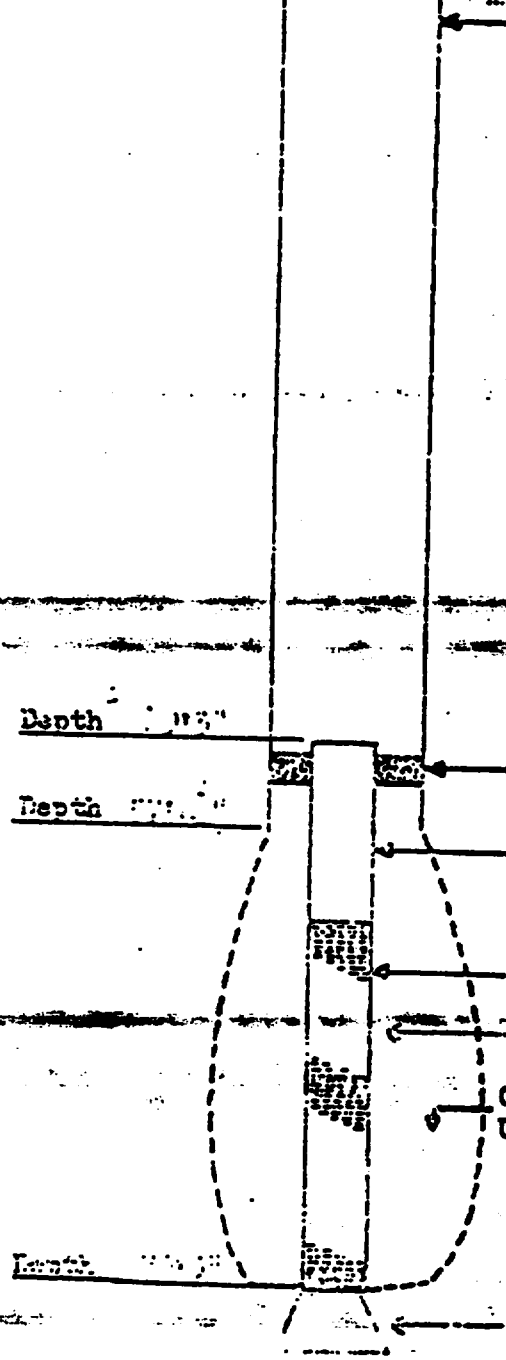
Layne Northern

3-3-59

Lot Number _____

To	From	FORMATIONS (Color, type of material, hardness, etc.)

(23)



Lapeer Co.
Calumet Twp

36N 9W

25 N 7

LAINE GRAVEL WALL WELL
Single Cased
For

Driller
Date Finished

Not drawn to scale
All depths measured
from ground level

Static Level
Pumped GPM
at Pumping Level

LAINE NORTHERN CO. INC.
MISHAWAKA INDIANA

DRAWN BY
APPROVED BY
DATE

DRAWING NO

(23)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 36N RGE. 9W ¼ SW ¼ SW SEC 35 Subdivision Name

Topo Map Highland ____ Ft W of EL. Ground Elevation 630 Layne - Northern

Field Located By ____ Date ____ ____ Ft N of SL. Depth to bedrock ____ 5-1-43

Courthouse Location By ____ Date ____ ____ Ft E of WL. Bedrock elevation ____

Location accepted w/o verification by ____ ____ Ft S of NL. Aquifer elevation ____ Lot Number ____

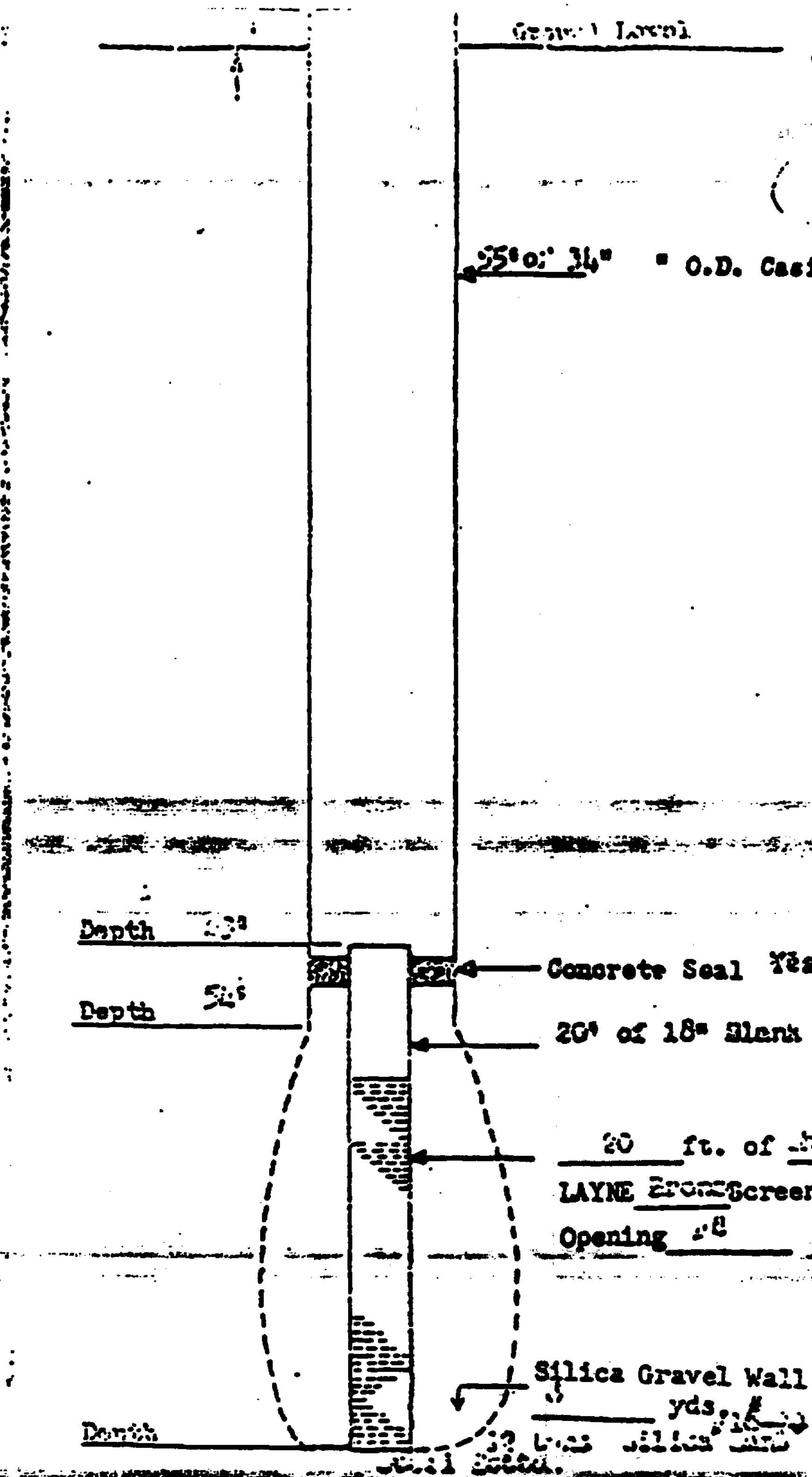
To	From	FORMATIONS (Color, type of material, hardness, etc.)

Location

Lake Co.
Calumet Twp.
Section 35

Sec 35
30N 9W Cor 2 NE

(24)



Single Cased
LAYNE GRAVEL WALL WELL No.
For

Driller
Date Finished

Not drawn to Scale
All depths measured
from ground level

Static Level
Pumped GPM
at Pumping Level

Sec 13

LAYNE NORTHERN CO. INC
INDIANA

DRAWN BY
APPROVED BY
DATE
DRAWING NO.

(24)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

?

COUNTY Lake TWP. 36N RGE. 9W SW ¼ SW ¼ SW ¼ SEC 35 Subdivision Name

Topo Map Highland ____ Ft W of EL. Ground Elevation 630 Cayuga - Northern

Field Located By ____ Date ____ ____ Ft N of SL. Depth to bedrock ____ 11-10-59

Courthouse Location By ____ Date ____ ____ Ft E of WL. Bedrock elevation ____

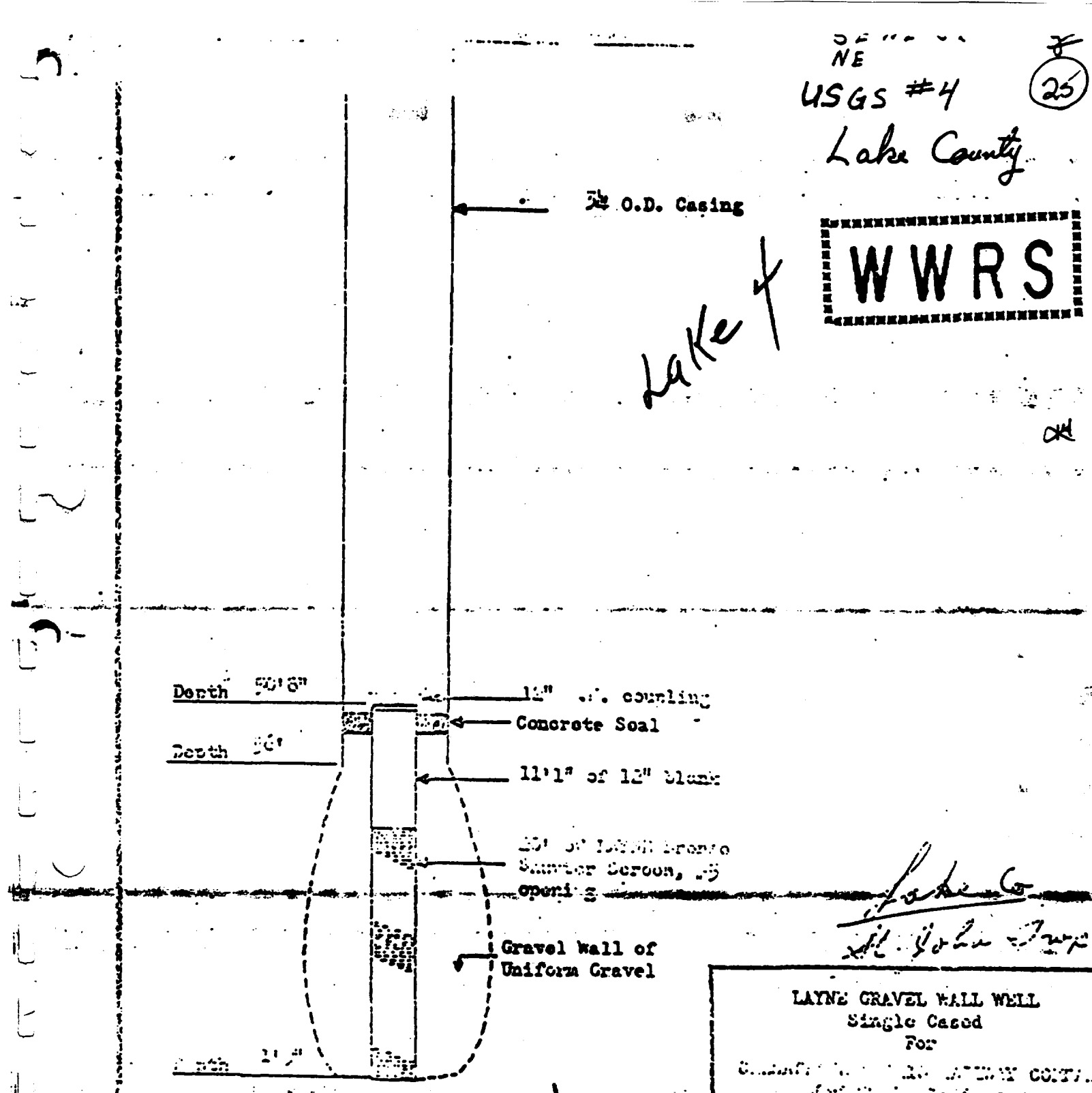
Location accepted w/o verification by ____ ____ Ft S of NL. Aquifer elevation ____ Lot Number ____

NE

USGS #4

(25)

Lake County



WWRS

Lake 4

SPC 14

LAYNE GRAVEL WALL WELL
Single Cased
For

LAYNE NORTHWEST CO. INC.
MICHAWAKA, INDIANA

Driller
Date Finished

Static Level

DRAWN BY
APPROVED BY

35-9W-2-51 (8)

Lake 4

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

WSGS obs well

COUNTY: Lake TWP. 35N RGE. 9W ___ ¼ NW ¼ SE ¼ SEC. 2

Topo Map: Highland 7½

Well log compiled By WHL Date 3-67
Courthouse located By ___ Date ___
Field located By ___ Date ___
Acc. w/o verification By ___ Date ___

___ Ft W of EL. Ground elevation 638
___ Ft N of SL. Depth to bedrock ___
___ Ft E of WL. Bedrock elevation ___
___ Ft S of NL. Aquifer elevation ___

Record 7-27-1956 to
High 11.95 on 4-18-1960
Low 19.40 on 10-31 1962

FORMATIONS (Color, type of material, hardness, etc.)	From	To
Lake 4 effected by nearby pumping of Twin ... of from Bull 18 p 92		
Soil, sandy, gray	0	8
Sand, medium and gravel	8	14
Clay, hard	14	38
Sand, fine to medium	38	41
Sand, coarse, gravel	41	46
Sand, coarse, and gravel	46	82
Clay at	82	

REMARKS: Bull 10 p26-92-218

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water

(26)

56' of 16" O.D. Casing

Depth 40'

Concrete Seal

Depth 50'

8' of 8" blank

12' of 8" Bronze gauze covered Screen

Gravel Wall of Uniform Gravel

Depth 62'

Some Million thick concrete

55 N 9 W sec 36 NE 5t

#1

#1 GRAVEL WALL WELL
Single Cased
For
INDIANA PIPE LINE COMPANY
GILPIN, INDIANA

58'

(26)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35N RGE. 9W ¼ SE ¼ NE SEC 33

Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation 561

Lot Number _____

Layne - Northern

1-13-43

From	To	
0	17	Fine sand
17	21	Clay
21	42	Cse sand
42	47	Fine sand
47	69	Med sand

(27)

35N 9W NE NW Sec 2-

2C1

Spc 1

(87)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35N RGE. 9W ¼ NE ¼ NW SEC 2 Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 635 Layne Northern

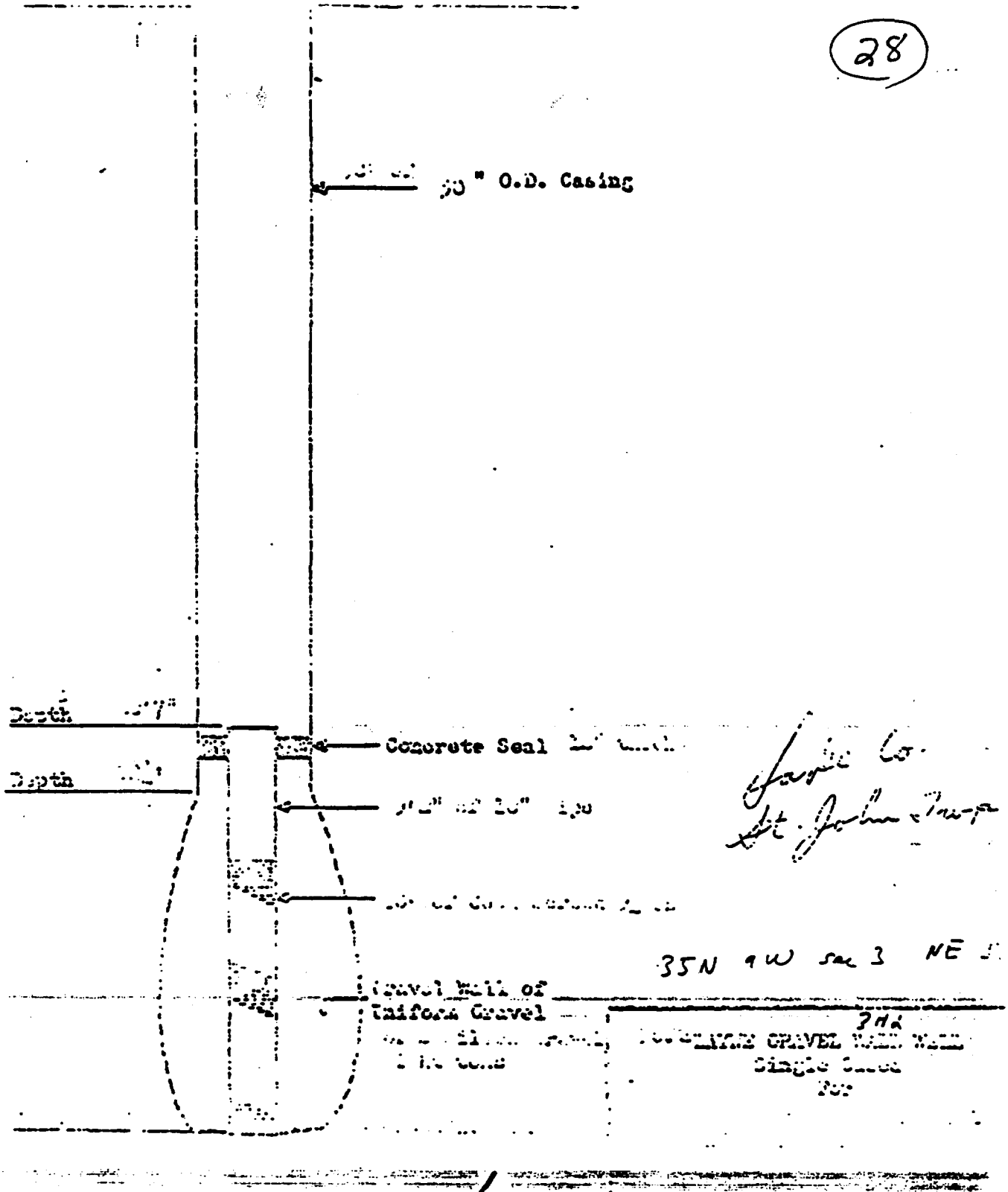
Depth to bedrock _____ 2-5-54

Bedrock elevation _____

Aquifer elevation _____ Lot Number _____

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	6	Sand brown
6	21	Sand grey
21	36	clay blue
36	40	Sand and some gravel
40	50	Sand and clay, stripe
50	55	Sand fine grey
55	80	Sand medium
80	86	Sand fine

28


30" O.D. Casing
Concrete Seal
Gravel Wall of Uniform Gravel
35N 9W sec 3 NE

(88)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake Co. TWP. 35 N RGE. 9W ¼ SE ¼ NE SEC 3 Subdivision Name

opo Map _____ Ft W of EL. Ground Elevation 630 Lyne Northern

ield Located By _____ Date _____ Ft N of SL. Depth to bedrock _____ 5-22-45

ourthouse Location By _____ Date _____ Ft E of WL. Bedrock elevation _____

ocation accepted w/o verification by _____ Ft S of NL. Aquifer elevation _____ Lot Number _____

17	21	43	40																											
0	17	21	43																											

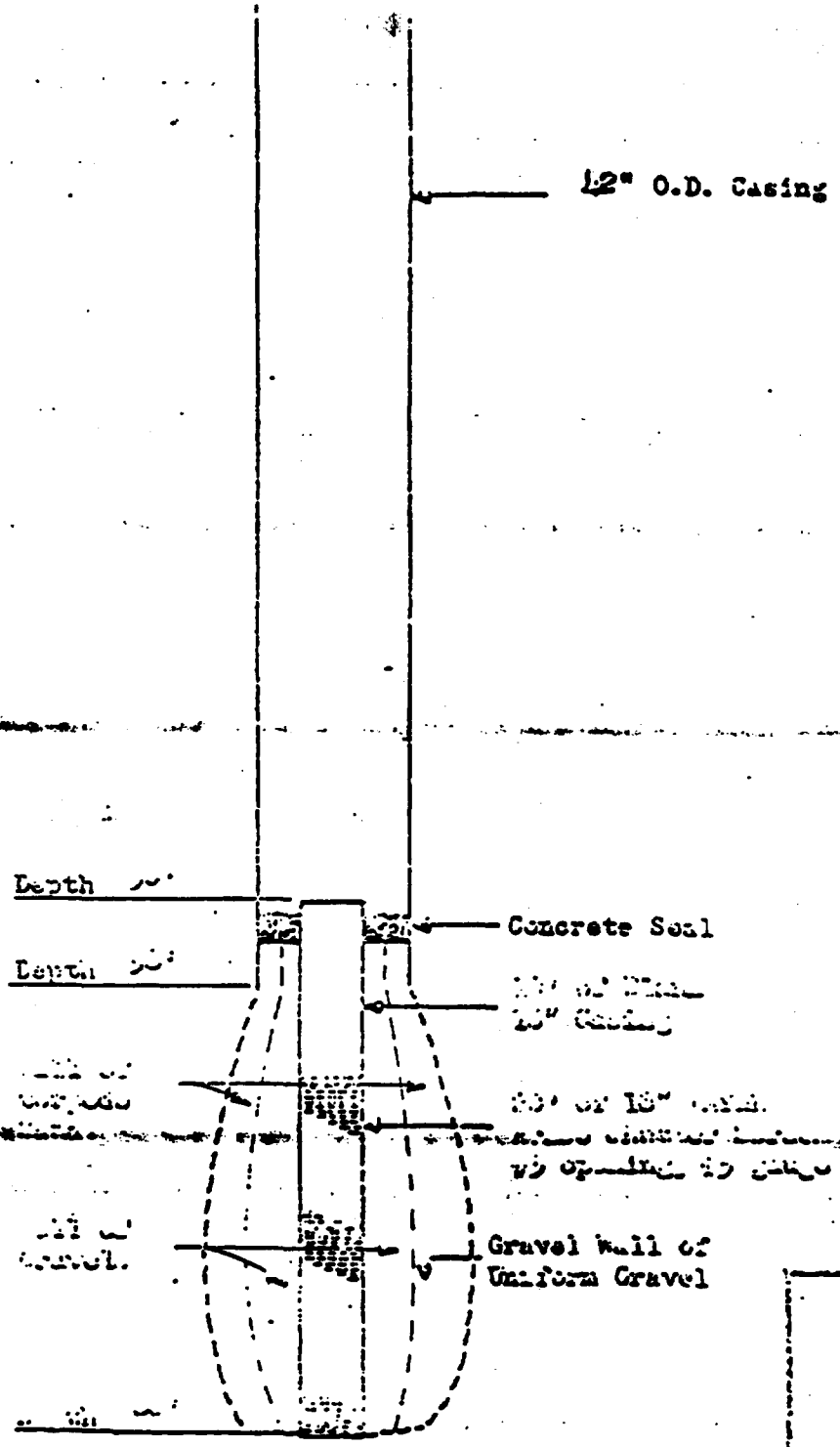
Fine sand

Clay

Coarse sand

Fine sand

29



36N 9W SWSWSW?

SPC 21

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

(89)

COUNTY Lake TWP. 36N RGE. 9W ¼ SW ¼ SW SEC 35 Subdivision Name

Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 630

Depth to bedrock _____ 6-1-39

Bedrock elevation _____

Aquifer elevation _____ Lot Number _____

WWDS

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	17	Fine sand
17	31	Clay
31	32	Gravel and clay
32	35	Clay
35	40	Gravelly clay
40	60	Medium sand
60		Fine sand

In Georgia WQ principal

INDIANAPOLIS, INDIANA 46204

Telephone 317-232-4160

WWRS

WATER WELL RECORD

(30)

WELL LOCATION (Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctiv landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Chesapeake and Ohio Address

Building Contractor Railroad Company Address

Name of Well Drilling Contractor: C. H. Miller

Address

Name of Drilling Equipment Operator:

WELL INFORMATION

Depth of well: 148 Date well was completed: 12-7-51

Diameter of casing or drive pipe: 4 Total Length:

Diameter of liner (if used): Total Length:

Diameter of Screen: Length: Slot Size: Aplat

Type of Well: Drilled X Gravel Pack ☐ Driven ☐ Other

Use of Well: For Home ☐ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) feet

Bailer Test: Hours Tested Rate g.p.m. Drawdown ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested Rate g.p.m. Drawdown ft.

yield 21 gpm

Signature Lowell Wolfe, Sept 1984, Lake Co.

Date USGS Bull #10 and WWRS

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

WWRS

COUNTY Lake TWP. 35N RGE. 9W ¼ SE ¼ NW SEC. 2 Subdivision Name

(30) Topo Map Highland

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

_____ Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

_____ Ft S of NL.

Ground Elevation 640

Depth to bedrock 131

Bedrock elevation 509

Aquifer elevation _____

Lot Number _____

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	119	fine sand
119	127	blue clay
127	131	fine sand
		Middle Silurian series
131	135	dolomite and dolomitic limestone
		with shale
135	148	limestone and dolomite

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46209
MElrose 3-6757

(31)

35-9w-2-J-1

WATER WELL RECORD

Lake 4

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township:

Congressional township: 35 N Range: 9 W Number of section: 2

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: Griffith Ches e Ohio RR

Name of owner: Ches e Ohio R R Address: Griffith

Name of Well Drilling Contractor: Layne Northern Co.

Address:

Name of Drilling Equipment Operator:

INFORMATION ON THE WELL

Completed depth of well: 82 ft. Date well was completed: 12-5-1939

Diameter of outside casing or drive pipe: 34 Length: -

Diameter of inside casing or liner: 12 Length: 51 ft

Diameter of Screen: 12 in Length: 20 ft Slot size:

Type of Well: Drilled ☒ Gravel Pack ☒ Driven ☐ Other

Use of Well: For home ☐ For industry ☒ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☐ Driven ☐

Static water level in completed well (Distance from ground to water level) 18.01 ft. 7-27-1956

Bailer Test: Hours tested ____ Rate ____ g.p.m. Drawdown ____ ft. (Difference between static level and wat

Pumping Test: Hours tested ____ Rate 330 g.p.m. Drawdown 23 ft. level at end of test.

Signature Bull 10; and dd card cete

Date D. Uffer and other citations

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET 2-12-67

35-9W-2-51

(31)

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
~~Lake 4 affected by nearby pumping and draining from Bull 10 P 92~~		
Soil, sandy, gray	0	8
Sand, medium and gravel	8	14
Clay, hard	14	38
Sand, fine to medium	38	41
Sand, coarse & gravel	41	46
Sand, coarse, and gravel	46	82
Clay at	82	

High 11.95 on 4-18-1960
Low 19.40 on 10-31-1962

REMARKS: Bull 10 P26-92-218

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY: Lake

TWP. 35N RGE. 9W ¼ NW ¼ SE ¼ SEC. 2

Topo Map: Highland 7½

Well log Compiled By Ubb Date 3-67
Courthouse located By ___ Date ___
Field located By ___ Date ___
Acc. w/o verification By ___ Date ___

___ Ft W of EL. Ground elevation 635
___ Ft N of SL. Depth to bedrock ___
___ Ft E of WL. Bedrock elevation ___
___ Ft S of NL. Aquifer elevation ___

Record 7-27-1956 ft

Lake 4

INSTRUCTIONS

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As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water

(32)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weiss

535775
465220

WWRS

BH (17)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner American Chemical Address Gulfport St. Griffith, Ind.

Building Contractor _____ Address _____

Name of Well Drilling Contractor: John Farmer & Sons Well & Pump Service Inc

Address 9703 Kennedy Ave - Highland - Indiana 46322

Name of Drilling Equipment Operator: Jarod Farmer

WELL INFORMATION

Depth of well: 74ft Date well was completed: Sept. 14-1971

Diameter of casing or drive pipe: 2" Total Length: 69ft

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 1 1/4" Length: 5ft Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☑ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) II. feet

Bailer Test: Hours Tested I Rate 15 g.p.m. _____ Drawdown None ft.

Pumping Test: Hours Tested I Rate 15 g.p.m. _____ Drawdown None ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Edelma D. Gaglardi-Secy

Date Oct. 9-1971

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(32)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

American Chem

COUNTY _____ TWP. 35N RGE. 9W NW ¼ NE ¼ SE SEC 2 Subdivision Name _____

Topo Map _____ 1000 Ft W of EL. Ground Elevation 635

Field Located By Roberts Date ISBH 8/12/81 2950 Ft N of SL. Depth to bedrock _____

Courthouse Location By _____ Date _____ _____ Ft E of WL. Bedrock elevation _____

Location accepted w/o verification by _____ _____ Ft S of NL. Aquifer elevation 560 Lot Number _____

GW STRATEGY PROJECT - ISBH

WATER WELL LOG

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	5	Soil
5	19	Sand
19	62	Clay & Silt
62	74	Clean Sand

635 ft
560

(33)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

545815
05225

WRS

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner American Chemical Co Address Cofax Street - Griffith, In

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer & Sons Well & Pump Service Inc.

Address 9703 Kennedy Ave - Highland - Indiana 46322

Name of Drilling Equipment Operator: Carroll Farmer

WELL INFORMATION

Depth of well: 265 ft Date well was completed: Feb. 24-1972

Diameter of casing or drive pipe: 4" Total Length: 131'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: _____ Length: _____ Slot Size: _____

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☑ Rotary ☐ Rev. Rotary ☐ Jet ☐ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate ____ g.p.m. 20 Drawdown -0- ft.

Pumping Test: Hours Tested 2 Rate ____ g.p.m. 10 Drawdown -0- ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma L. Gagliardi

Date March 13-1972

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(33)

WATER WELL LOG

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY _____ TWP. 35N RGE. 6W SW ¼ SE ¼ NE SEC 2 Subdivision Name American Oil

Topo Map _____ Field Located By DTK Date 7/31/86 Courthouse Location By _____ Date _____

Location accepted w/o verification by Manager of Camp, verified well locations

1000 Ft W of EL. _____ Ft N of SL. _____ Ft E of WL. 2750 Ft S of NL.

Ground Elevation 635 Depth to bedrock 131 Bedrock elevation 504 Aquifer elevation _____ Lot Number _____

14 deep wells

FORMATIONS (Color, type of material, hardness, etc.)	From	To
Soil	0	2
Clay	2	90
Clean Sand	90	110
Silt	110	131
Limestone	131	265

☐ TEST
☐ PERMANENT

Job No. M10,120 (34)

WELL LOG No. 7 CITY Griffith County Lake

Owner Packaging Corp. of America-Hapes Molded Div. Township Calumet

Section 2

Location State Indiana

From Land Description ______ ft. East and ______ ft. North of SW Corner of Section.

From Street or Road 40' N. of West Main St. 12' West of R.R. Siding
South East corner of property North of Main St.

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Top Soil			1'	
Sand	1'	14'	13'	7'
Blue Clay	14'	29'	15'	
Fine Grey Sand	29'	83'	54'	19'6"
Fine muddy sand at 53'				

______ inch diameter hole drilled by ☐ Cable Tool ☐ Rotary ☐ Jetting

Pipe left in hole

Date Started 10-22-59 Finished 11-10-59 C. Nichols
Driller

34

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

TY: Lake TWP 26 N RGE 6 W ____ ¼ ____ ¼ ____ ¼ SEC. ________

Map: ________

log classified By ________ Date ________	________ Ft W of EL.	Ground elevation ________
thouse located By ________ Date ________	________ Ft N of SL.	Depth to bedrock ________
d located By ________ Date ________	________ Ft E of WL.	Bedrock elevation ________
w/o verification By ________ Date ________	________ Ft S of NL.	Aquifer elevation ________

REMARKS:

Accepting ...

Joyne 11-10 59

INSTRUCTIONS

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☐ PERMANENT Didn't plot Job No. 1110,126

WELL LOG No. 59 CITY Griffith County Lake

Owner Packaging Corp. of America (Formerly Rapes Hiper Co.) Township Calumet

Section 2

Location State Indiana

From Land Description ft. East and ft. North of SW Corner of Section

From Street or Road 45' E. of east west st. 60' N. of S.E. corner of plant

34A

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Fill	0	4	4	
Fine sand	4	18	14	
Clay	18	32	14	
Sand	32	80	48	15'
Rocky Sand	80	86	6	

6 inch diameter hole drilled by ☒ Cable Tool ☐ Rotary ☐ Jetting

Pipe left in hole Zone

Date Started 10-14-59 Finished 10-21-59 G. E. Patz

DRILLER

2nd Packaging Corp Well

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

Packaging Corp

COUNTY Lake TWP. 36 N RGE. 9 W ¼ ¼ SEC 34 35 Subdivision Name

Topo Map Highland 7½ Ft W of EL. Ground Elevation Lyons 5-7-A

Field Located By Date Ft N of SL. Depth to bedrock

Courthouse Location By Date Ft E of WL. Bedrock elevation

Location accepted w/o verification by Ft S of NL. Aquifer elevation Lot Number

(55)

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

Water sample collected by Ron Weiss

5B H (16) 5765?0 466225

WATER WELL RECORD

WWRS

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Calumet Twp -

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner Salisbury Engineering Address Main Street - Griffith, In

Building Contractor _____ Address _____

Name of Well Drilling Contractor: John Farmer & Sons Well & Pump Service Inc.

Address 9763 Kennedy Avenue - Highland, Indiana 46322

Name of Drilling Equipment Operator: Jared A. Farmer

WELL INFORMATION

Depth of well: 12ft Date well was completed: May 10-1972

Diameter of casing or drive pipe: 4" Total Length: 74ft

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 3 Length: 8ft Slot Size: .006

Type of Well: Drilled ☒ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☒ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☒ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate ____ g.p.m. 20 Drawdown 0 ft.

Pumping Test: Hours Tested 2 Rate ____ g.p.m. 18 Drawdown 0 ft.

(Drawdown is the difference between static level and water level at end of test)

Signature Adelma I. Gagliardi - Secy.-Treas.

Date June 14-1972

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
Soil	0	2
Clay	2	14
Sand	14	57
Gravel	57	67
Clay	67	74
Clean Coarse Sand	74	82

635
82
553

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY ____ TWP. 35N RGE. 9W NE ¼ NE ¼ NW ¼ SEC. 1 Subdivision Name ____

Topo Map ____ Ft W of EL. ____ Ground Elevation 635

Field Located By [illegible] Date 1581 8/12/81 ____ Ft N of SL. Depth to bedrock ____

Courthouse Location By ____ Date ____ 2200 Ft E of WL. Bedrock elevation ____

Location accepted w/o verification by ____ 250 Ft S of NL. Aquifer elevation 553 Lot Number ____

GW STRATEGY PROJECT - ISBH

WRC

DIVISION OF WATER
DEPARTMENT OF NATURAL RESOURCES, STATE OF INDIANA
STATE OFFICE BUILDING
INDIANAPOLIS, INDIANA 46204
Telephone 633-5267 Area Code 317

(36)

Water sample collected by Ron Weir

594950
4/21/75

WWRS

SBH (32)

WATER WELL RECORD

WELL LOCATION

(Fill in completely - Refer to instruction sheet)

County in which well was drilled Lake County Civil Township Calumet Twp

Driving directions to the well location: Include County Road Names, Numbers, Subdivision Name, lot number, distinctive landmarks, etc.

NAME OF WELL OWNER and/or BUILDING CONTRACTOR

Well Owner ~~Gene Gilbert~~ Arthur Hegedus Address 1009 S. Wood Street - Griffith, Ind

Building Contractor _____ Address _____

Name of Well Drilling Contractor: J. Farmer Stone Well & Pump Service

Address 9703 Kennedy Ave - Highland, Indiana 46322

Name of Drilling Equipment Operator: Donald Farmer

WELL INFORMATION

Depth of well: 53 ft Date well was completed: June 5-1973

Diameter of casing or drive pipe: 3" Total Length: 48'

Diameter of liner (if used): _____ Total Length: _____

Diameter of Screen: 1½" Length: 5 ft. Slot Size: .006

Type of Well: Drilled ☑ Gravel Pack ☐ Driven ☐ Other _____

Use of Well: For Home ☑ For Industry ☐ For Public Supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Bucket Rig ☐

Static water level in completed well (Distance from ground to water level) _____ feet

Bailer Test: Hours Tested 2 Rate 12 g.p.m. Drawdown 0 ft. (Drawdown is the difference between static level and water level at end of test)

Pumping Test: Hours Tested 2 Rate 10 g.p.m. Drawdown 0 ft.

Signature Celma I. Gagliardi - Secy-Treas

Date July 19-1973

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

(36)

FOR ADMINISTRATIVE USE ONLY
(Well driller does not fill out)

COUNTY Lake TWP. 35 N RGE. 9 W NW ¼ NW ¼ NE SEC 11 Subdivision Name

Topo Map Highland SE

Field Located By _____ Date _____

Courthouse Location By _____ Date _____

Location accepted w/o verification by _____

2630 Ft W of EL.

_____ Ft N of SL.

_____ Ft E of WL.

150 Ft S of NL.

Ground Elevation 638

Depth to bedrock _____

Bedrock elevation _____

Aquifer elevation _____ Lot Number _____

WWRS

WATER WELL LOG

From	To	FORMATIONS (Color, type of material, hardness, etc.)
0	2	Soil
2	21	Yellow Sand
21	38	Blue Clay
38	46	Brown Sand
46	53	Clean Sand

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

(55)

RECEIVED NOV 1959 Dept. of Conservation Division of Water Resources

Amer

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: _____

Congressional township: _____ Range: _____ Number of section: _____

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: Northwest Corner of Section Corfax & Ridge Road - Gary, Ind.

Name of owner: Mr Cook Address: Corfax & Ridge Rd - Gary Ind.

Name of Well Drilling Contractor: John Farmer

Address: 2830 - 45th Street

Name of Drilling Equipment Operator: Paul Kibbert

INFORMATION ON THE WELL

Completed depth of well: 89 ft. Date well was completed: July 1-1959

Diameter of outside casing or drive pipe: 2" Length: 21 ft.

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) 12 ft ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 12 g.p.m. Drawdown _____ ft.

Signature John Farmer G.I. Sec

Date November 14-1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
REMARKS:		

(5)

FOR ADMINISTRATIVE USE ONLY
(If Driller does not fill out)

COUNTY: Lake TWP. 36N RGE. 9W ¼ ¼ ¼ SEC. 23

Topo. Map: Highland 22' Loc. accepted w/o verification Yes ___ No ___

El. of grnd. surface at well: _____ Courthouse Loc. By _____ Date _____

Depth to bedrock: _____ Field Located By _____ Date _____

Well Log processed by: _____ Placed in Master Well Log File Date _____

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

(56)

DIVISION OF WATER RESOURCES
INDIANA DEPARTMENT OF CONSERVATION
311 WEST WASHINGTON STREET
INDIANAPOLIS, INDIANA

WATER WELL RECORD

INFORMATION ON WELL LOCATION

County in which well was drilled: Lake Civil Township: Calumet Township

Congressional township: T 36 N Range: R 9 W Number of section: 36

(Fill in as completely as possible)

Describe in your own words the well location with respect to nearby towns, roads, streets or distinctive landmarks: _____

Name of owner: John Rosinka Address: Griffith

Name of Well Drilling Contractor: John Farmer

Address: 2830 - 45th St. Highland, Indiana

Name of Drilling Equipment Operator: Paul Kikert

INFORMATION ON THE WELL

Completed depth of well: 71 ft. Date well was completed: Oct 13-1959

Diameter of outside casing or drive pipe: 3" Length: 21 ft

Diameter of inside casing or liner: _____ Length: _____

Diameter of Screen: 1½" Length: 4 ft Slot size: 60

Type of Well: Drilled ☐ Gravel Pack ☐ Driven ☑ Other _____

Use of Well: For home ☑ For industry ☐ For public supply ☐ Stock ☐

Method of Drilling: Cable Tools ☐ Rotary ☐ Rev. Rotary ☐ Jet ☑ Driven ☐

Static water level in completed well (Distance from ground to water level) _____ ft.

Bailer Test: Hours tested _____ Rate _____ g.p.m. Drawdown _____ ft. (Difference between static level and water level at end of test)

Pumping Test: Hours tested 1 Rate 15 g.p.m. Drawdown 25 ft.

Signature John Farmer - C.E. Lic

Date Nov. 14- 1959

FOR WELL LOG SPACE USE REVERSE SIDE OF THIS SHEET

56

WATER WELL LOG

FORMATIONS (Color, type of material, hardness, etc.)	From	To
REMARKS:		

COUNTY: Lake TWP. 36 N RGE. 9W ¼ ¼ ¼ SEC. 36

Topo. Map: Highland 2' Loc. accepted w/o verification Yes — No —

El. of grnd. surface at well: _____ Courthouse Loc. By _____ Date _____

Depth to bedrock: _____ Field Located By _____ Date _____

Well Log processed by: _____ Placed in Master Well Log File Date _____

FOR ADMINISTRATIVE USE ONLY
(Driller does not fill out)

INSTRUCTIONS

This Water Well Record form is designed to record the most essential data concerning a water well. We request that you be as accurate as possible in recording this information as it may be of great assistance in the planning and development of new water supplies.

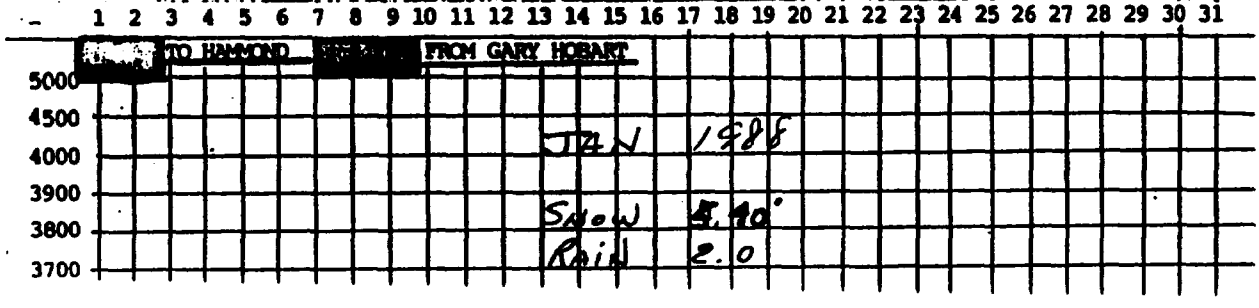
An accurate location of the well is equally as important as an accurate well log. Please include all information possible in the space provided for well location.

As specified in Chapter 6 of the Acts of 1959, a copy of this report must be submitted within thirty days after the completion of a well to the Division of Water Resources, Indiana Department of Conservation, 311 West Washington Street, Indianapolis, Indiana.

APPENDIX M

Precipitation Records for Griffith, Indiana

DATE		To Hammond	From Gary Hobart		Inflation
1		2844,000	1468,000	1593,000	1251,000
2		2,122,000	1,415,000	1,540,000	582,000
3		~~1,437,000~~ 2053,000	~~1,536,000~~	1,661,000	~~266,000~~ 392,000
4		~~2,054,000~~ 1,927,000	~~1536,000~~ 1741,000	1966,000	61,000
5		1,716,000	1,340,000	1,465,000	251,000
6		1,790,000	1,401,000	1,526,000	264,000
7		1678,000	1.383,000	1508,000	170,000
8		1,665,000	1,465,000	1510,000	75,000
9		1,635,000	1,141,000	1,266,000	369,000
10		1,687,000	1,890,000	2026,000	(338,000)
11		1,644,000	1,652,000	1777,000	(138,000)
12		1,465,000	1,331,000	1,456,000	9,000
13	*0.2"	1,188,000	1,434,000	1559,000	229,000
14		1,806,000	1,443,000	1568,000	238,000
15	*0.5"	1,565,000	1,349,000	1,471,000	91,000
16		1,450,000	1,354,000	1,479,000	(29,000)
17		1,737,000	1,493,000	1,618,000	119,000
18	1.0	2,740,000	1,454,000	1,579,000	1,161,000
19		2,286,000	1,434,000	1559,000	727,000
20	1.0"	3.049,000	1,369,000	1,494,000	1,556,000
21		2,543,000	1,356,000	1,481,000	1.062,000
22	* 0.1"	3.067,000	1.323,000	1.448,000	1. 619,000
23		2274,000	1267,000	1,392,000	882,000
24	*2.0"	2.154,000	1,350,000	1,475,000	679,000
25	*1.0"	2,023,000	1,411,000	1536,000	487,000
26	*0.5"	1.926,000	1,373,000	1,498,000	428,000
27	*0.6"	1.836,000	1.364,000	1,489,000	347,000
28		1.784,000	1,372,000	1.504,000	280,000
29		1.194,000	1,368,000	1493,000	301,000
30		2,107,000	1480,000	1,605,000	502,000
31		2,272,000	1606,000	1,731,000	540,000



Feb 1988

Rain 0.9
snow 23.95

Day		To Hammond	From Coley Hodnet		Infiltration
1	0.1"	2.896,000	1,282,000	1,407,000	1,489,000
2	*1.5"	2.640,000	1.607,000	1.732,000	908,000
3		2.526,000	1,410,000	1,535,000	991,000
4	4.0"	2,283,000	1,337,000	1,462,000	821,000
5	0.2"	2,234,000	1,314,000	1,439,000	795,000
6		2,237,000	1,328,000	1,453,000	784,000
7		2,198,000	1,390,000	1,515,000	683,000
8		1,999,000	1,417,000	1,542,000	457,000
9	*1.0"	1,131,000	1,418,000	1,543,000	194,000
10	*2.25"	1,126,000	1,350,000	1,475,000	251,000
11	*5.0"	1,592,000	1,315,000	1,440,000	152,000
12	*9.0"	1,528,000	1,344,000	1,471,000	57,000
13		1,518,000	1,318,000	1,443,000	75,000
14		1,586,000	1,462,000	1,587,000	(1,000)
15	0.6"	2,507,000	1,396,000	1,521,000	986,000
16	0.2"	2,778,000	1,483,000	1,608,000	1,170,000
17		2,282,000	1,355,000	1,480,000	802,000
18		2,485,000	1,305,000	1,430,000	1,055,000
19		2,555,000	1,310,000	1,495,000	1,060,000
20	*0.5"	2514,000	1,349,000	1,474,000	1,040,000
21	*0.5"	2,253,000	1,311,000	1,506,000	747,000
22		2,045,000	1,458,000	1,583,000	462,000
23		2,728,000	1,483,000	1,548,000	1,180,000
24		2,412,000	1,434,000	1,559,000	853,000
25		2,150,000	1,303,000	1,428,000	722,000
26		1971,000	1,348,000	1,473,000	498,000
27		2054000	1,362,000	1,417,000	567,000
28		1,906,000	1,405,000	1,530,000	376,000
29		1,954,000	1,481,000	1,606,000	348,000

5.3" Rain

MONTHLY INFILTRATION

MONTH MARCH 1988

DATE		TO HAMMOND	FROM GREY HOBART	INFILTRATION
1		1984,000	1,402000 1528,000	456,000
2		1,853000	1.356,000 1.481,000	372,000
3		1.967000	1.381,000 1506,000	461,000
4		1.886,000	1.380,000 1.505,000	381,000
5		1.951000	1,388000 1.513000	438,000
6		1.866000	1405,000 1.530,000	336,000
7		1.771000	1.459,000 1584,000	187,000
8		1.947,000	1.458000 1583000	364000
9	0.1"	2.040,000	1.402,000 1527,000	517,000
10		1.949000	1.450,000 1.575,000	374,000
11		1.873,000	1.429000 1.554,000	319,000
12		1.804000	1.299000 1.429000	380,000
13	0.5"	1.893000	1.435,000 1.560,000	273,000
14	0.3"	1.806,000	1.463,000 1.588,000	218,000
15	0.2"	1,891,000	1,352.000 1.477.000	414,000
16		1.781,000	1.344,000 1.469,000	312.000
17		1,673,000	1.321,000 1446,000	227,000
18		1.552,000	1,395,000 1.520,000	32,000
19		1565,000	1,366000 1,491,000	74,000
20	0.1"	1.542,000	1,275,000 1.400,000	142,000
21		1.498000	1.551,000 1.676,000	(178,000)
22		1.642,000	1.394000 1.519,000	123,000
23		1.622,000	1391,000 1.516,000	106,000
24	0.5"	1793000	1.414,000 1539000	254,000
25	0.3"	2298,000	1.321,000 1.446,000	847,000
26	0.2"	2 110,000	1.439000 1.564000	546,000
27		2.029000	1.360,000 1.485,000	544,000
28	0.3"	1.881000	1.338,000 1.463,000	418,000
29	1.3"	3.200,000	1,223,000 1.348,000	1,852,000
30	1.5"	3598,000	1340,000 1.465,000	2 133,000
31		3438,000	1.351,000 1.476,000	1.962,000

5.20 Rain

MONTHLY INFILTRATION

MONTH April 1988

DATE		TO HAMMOND	FROM GREY HOBART	INFILTRATION
1		3574000	1313,000 1438000	2096,000
2	0.2"	3305,000	1269000 1394,000	1,911,000
3	0.5	3416,000	1,407000 1532,000	1,784,000
4	0.5	3526000	1,261,000 1,386,000	2.140,000
5		3,165,000	1,318,000 1,443,000	1,722,000
6	0.15"	3.456000	1,284,000 1,409000	2.047,000
7	2.0"	3,161,000	1,304000 1,429,000	1,732,000
8		3,519,000	1,295,000 1,420,000	2.099,000
9		3.491,000	1.318,000 1,443,000	2,048,000
10		3,330,000	1.392,000 1.517,000	1,813,000
11		3.036,000	1.481,000 1.606,000	1,430,000
12		2,911,000	1,382,000 1,507,000	1404,000
13		2,671,000	1,341,000 1,466,000	1,205,000
14	0.05"	2417,000	1,394,000 1,519000	958,000
15		2214,000	1,329000 1,454,000	760,000
16		2075,000	1,284000 1409000	666,000
17		2066,000	1,425,000 1541,000	520,000
18	0.15"	2.082,000	1.521,000 1646000	436,000
19		1.925,000	1.392,000 1515,000	410,000
20		1.771,000	1,397,000 1522,000	149,000
21	0.15"	1,155,000	1,334,000 1459,000	296,000
22	0.1"	1,141,000	1,334000 1459,000	288,000
23	0.2"	1.716,000	1,446,000 1.621,000	95,000
24		1.683,000	1.404,000 1.529000	154000
25		1.736,000	1.451,000 1.576000	160,000
26		1.718000	1,104,000 1.229000	549,000
27	0.3"	1.772,000	1,483,000 1.608,000	164,000
28	0.3	1.943,000	1.511,000 1.636,000	307,000
29			1,330,000 1,455000	331,000
30		1786,000	1,330,000 1,455000	331,000
31				

RAIN FALL.
2.6"

MONTHLY INFILTRATION
MONTH MAY, 1988

DATE		TO HAMMOND	FROM GREY HOBART		INFILTRATION
1		1562,000	1437,000	1562,000	—
2		1,315.000	1,751,000	1,876,000	(561,000)
3		1.492 000	1.691,000	1,816,000	(324000)
4		1.413, 000	1,570,000	1695,000	(282.000)
5		1270 .006	1.396,000	1521,000	(251 000)
6		1.597000	1.619000	1744,000	(147000)
7		1629000	1644000	1769,000	(140,000)
8		1.509 000	1.806,000	193,000	(422,000)
9	0.3	1507000	1625,000	1.750,000	(243,000)
10	0.1	1668 000	1504000	1629,000	39,000
11		1.514000	1,432 000	1557,000	(43,000)
12		1.534000	1559 000	1.684000	(150,000)
13		1.373.000	1727000	1.852000	(479000)
14		1.434000	1.560.000	1685,000	(251,000)
15		1420000	2034000	2159000	(739000)
16	0.2	1267000	1722000	1847000	(580,000)
17		1.405,000	1.649000	1774000	(369,000)
18		1.357,000	1,708000	1833 000	(476,000)
19		1.420,000	1980,00	2105,000	(685,000)
20		1.350 000	2004000	2129,000	(778,000)
21		1.413,000	2084000	2209000	(796,000)
22		1.271,000	2346,000	2471,000	(1200,000)
23		1.274,000	2073,000	2198000	(924,000)
24	2.0	1966,000	1.586,000	1711,000	255000
25		1.884000	1.432.000	1557,000	327000
26		1.625,000	1560,000	1685,000	(60,000)
27		1533000	1796,000	1921,000	(388000)
28		1.472,000	1984000	2109000	(637,000)
29		1313 000	2226,000	2351,000	(1.038,000)
30		1.272,000	2530,000	2655,000	(1383,000)
31		1,281,000	2538,000	2669000	(1,427,000)

RAIN FALL
2.3'

MONTHLY INFILTRATION
MONTH JUNE 1988

DATE	TO HAMMOND	FROM GARY HOBART	INFILTRATION
1	1,357000	2676,000 2801,000	(444000)
2	1,369,000	2509000 2634000	(1265,000)
3	1218,000	2116000 2241,000	(1023,000)
4	1144,000	1985,000 2110,000	(966000)
5	1164,000	2653,000 2778,000	(1813,000
6	1234,000	2638,000 2763000	(1529000)
7	1245,000	2758,000 2883000	(1638000)
8	1266,000	2779000 2904000	(1628,000)
9	1293000	2339,000 2464,000	(1,171,000)
10	1229,000	2089000 2214000	(1085,000)
11	1311,000	917,000 1,042,000	731000
12	1,230,000	—	—
13	1,121,000	—	—
14	1,270,000	2363000 2488000	(1,218,000)
15	1394000 ~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
16	1,459,000 ~~STOPPED~~	~~[illegible]~~	
17	1392,000	1,606,000 1,731,000 ~~2450,000 2575000~~	(339000)
18	1,370,000	1,890,000 2015,000 ~~2554000 2679000~~	(645,000)
19	1,244,000	2346000 2471000	(1225,000)
20	1,111,000	2137,000 2262000	(1,151,000)
1.5 21	1,497,000	1,856,000 1981,000	(484000)
22	513000	1,777,000 1902000	1384000
23	STOPPED	1,853,000 1,978,000	
24	STOPPED	1,896,000 2021,000	
25	"	1,942,000 2067000	
26	"	2,181,000 2,306,000	
27	"	1,836,000 1,961,000	
28	"	2379000 2504000	
0.8' 29	"	2351000 2476000	
30	"	1,638,000 1763,000	
31			

RAIN FALL 4.3"

MONTHLY INFILTRATION
MONTH July 88'

	DATE	TO HAMMOND	FROM GREY HOBART	INFILTRATION
	1	STOPPED	1,847,000 1972,000	
	2	"	2230,000 2355,000	
	3	"	1,999,000 2124,000	
	4	"	1,891,000 2022,000	
	5	"	2099000 2224,000	
	6	"	2744,000 2869000	
	7	"	2892,000 3017,000	
	8	"	2655000 2778,000	
	9	"	2635,000 2760,000	
	10	"	2539,000 2664,000	
	11	"	1901,000 2026,000	
	12	"	2602,000 2727,000	
	13		2795,000 2920,000	
	14		2620,000 2745,000	
	15		2793,000 2918,000	
	16		2822,000 2947,000	
	17		2150,000 2275,000	
	18		2554000 2679000	
1.5"	19		1634,0001,759,000	
	20		1771,000 1896,000	
0.6"	21		1.572,000 1.697,000	
	22		1728,000 1853,000	
	23		1764,000 1889,000	
	24		1904,000 2029,000	
0.1"	25		1.913,000 2038,000	
0.1"	26		1.686,000 1.811,000	
	27		1.943,000 2.063,000	
	28		2112,000 2237,000	
	29	853000	2,466,000 2591,000	
	30	1,453,000	2070,000 2195,000	(756,000)
2.0"	31	1520,000	1,637,000 1762,000	(242,000)

RAINFALL = 8"

MONTHLY INFILTRATION
MONTH August

	DATE	TO HAMMOND	FROM GREY HOBART	INFILTRATION
	1	1,094,000	1652,000 1783,000	(693,000)
	2	1147,000	2123,000 2,248,000	(1101,000)
	3	1.213,000	2259,000 2,384,000	(1,171,000)
1.0	4	1480,000	1.810,000 1935,000	(455000)
	5	1.267,000	1.844,000 1969,000	(702,000)
	6	1,262,000	1,810,000 1.935,000	(673,000)
	7	1.151,000	1,923,000 2048,000	(997,000)
	8	1.056,000	1.902,000 2027,000	(971,000)
3.5"	9	2,223,000	1,937,000 2,062,000	161,000
0.1	10	2322,000	1.572,000 1,697,000	625,000
1.5"	11	2.606,000	1724,000 1.894,000	757,000
	12	1,928,000	1,827,000 1932,000	24,000
	13	1.688,000	1.927,000 2052,000	(364,000)
0.3"	14	1.515,000	1.880,000 2005,000	(490,000)
	15	1.291,000	1.886,000 2011,000	(720,000)
0.1"	16	1,619,000	1.784,000 1909,000	(290,000)
	17	1530,000	1.953,000 2078,000	(548,000)
	18	1.406,000	2,001,000 2126,000	(720,000)
0.1	19	1.403,000	1,700,000 1.825,000	(422,000)
	20	1,948,000	1.507,000 1,632,000	(284,000)
	21	1270,000	1791,000 1922,000	(652,000)
	22	1,133,000	1791,000 1916,000	(783,000)
0.15"	23	1.364,000	1.597,000 1.722,000	(358,000)
	24	1273,000	1.666,000 1791,000	(518,000)
	25	1244,000	1777,000 1.902,000	(658,000)
	26	1217,000	1939,000 2.064,000	(847,000)
1.25"	27	1.208,000	1.823,000 1948,000	(615,000)
	28	1.750,000	1,492,000 1,617,000	33,000
	29	1,148,000	1525,000 1.650,000	(502,000)
	30	1,362,000	1647,000 1772,000	(410,000)
	31	1223,000	1.597,000 1722,000	(499,000)

RAINFALL 2.50"

MONTHLY INFILTRATION

MONTH Sept - 88

DATE		TO HAMMOND	FROM GREY HOBART	INFILTRATION
1		1356,000	1734000 1859000	(503,000)
2		1250,000	1684,000 1.809000	(559,000)
3		1256,000	1.595,000 1.720,000	(464,000)
4	0.4	1207,000	1572000 1697,000	(489,000)
5	0.4"	934,000 8	1316,000 1441,000	(507,000)
6		1038,000	1,528,000 1.653000	(615,000)
7		1,242,000	1489000 1614000	(422,000)
8		1263,000	1621,000 1746000	(483,000)
9		1238,000	1.595,000 1720,000	(482,000)
10		1192,000	1674000 1799,000	(607,000)
11		1241,000	1783000 1908,000	(667,000)
12		1270,000	1837,000 1962,000	(692,000)
13		1288,000	1664,000 1789,000	(507,000)
14		1263, 1263000	1667,000 1792,000	(529,000)
15		1285,000	1773000 1898,000	(613,000)
16		1312,000	1702,000 1827,000	(515,000)
17		1310,000	1469,000 1594000	(284,000)
18		1382,000	1930,000 2055000	(673,000)
0.3" 19	0.3"	1281,000	1663000 1788,000	(507,000)
20	0.9"	1616,000	1483000 1608,000	8,000
21		1259,000	1416,000 1541,000	(282000)
22	0.2"	1225,000	1461,000 1586,000	(361,000)
23	0.2"	1330,000	1462,000 1587,000	(257,000)
24		1345,000	1454000 1579,000	(234000)
25		1156,000	1497,000 1622,000	(466,000)
26		1041,000	1462,000 1587,000	(546,000)
27		1414,000	1682,000 1807,000	(393,000)
28	0.1	1438,000	1593,000 1718,000	(280,000)
29		1314000	1500,000 1625,000	(311,000)
30		1199,000	1571,000 1696,000	(497,000)
31				

OCT 1988

RAIN FALL 7.35

MONTHLY MONTH

INFILTRATION

DATE	TO HAMMOND	FROM GREY HOBART	INFILTRATION
1	1208,000	1534000 1659000	(451,000)
2 1.5"	1469,000	1543000 1668,000	(199000)
3 0.2"	1264,000	1534000 1659000	(395,000)
4 0.1	1288,000	1620,000 1745,000	(457,000)
5	1471,000	1,436,000 156100 0	(90,000)
6	1461,000	1553,000 1678,000	(217,000)
7	1,319,000	1.419,000 1.544,000	(225,000)
8	1344,000	1.493,000 1.618,000	(224,000)
9	1211,000	1,509,000 1634,000	(423,000)
10	1245,000	1.685,000 1810,000	(565,000)
11	1,286,000	1.501,000 1626,000	(340,000)
12	1.147,000	1.487,000 1612,000	(465,000)
13	1140,000	1.418,000 1543,000	(353,000)
14	1.343,000	1.409,000 1534,000	(191,000)
15	1320,000	1,570,000 1.695,000	(375,000)
16 0.5"	1.300,000	1.601,000 1726,000	(426,000)
17 0.2"	1316,000	1,544,000 1669,000	(403000)
18 3.5"	2757,000	1.445,000 1570,000	1.187,000
19	2,297,000	1,395,000 1520,000	813,000
20	1807,000	1.455,000 1580,000	227,000
21 0.25"	1735,000	1361,000 1486,000	249,000
22 0.1"	1.788,000	1.412,000 1537,000	251,000
23 0.4"	1593,000	1523,000 1.648,000	(65,000)
24 0.5"	1.895,000	1.502,000 1.627,000	268,000
25	1.697,000	1.466,000 1.591,000	106,000
26	1.572,000	1.465,000 1590,000	(18,000)
27 0.1"	1.469,000	1474000 1599,000	(130,000)
28	1531,000	1.360,000 1.485,000	46,000
29	1469,000	1.474,000 1.599,000	(130,000)
30	1477000	1481,000 1.606,000	(129,000)
31	1625,000	1.546,000 1671,000	(46,000)

MONTHLY INFILTRATION

MONTH NOV 1988

+125,000 Recharging Well

ITE	To Hammond	From Grey Hobart	INFILTRATION	
	601,000	1320,000 1445,000	156,000	
	63,000	1,400,000 1525,000	138,000	
	141,000	1,344,000 - 1,469,000	- 28,000	
	407,000	1,370,000 - 1,495,000	- 88,000	
5	1,819,000	1,337,000 - 1,462,000	+ 357,000	1.0" Rain
6	1,422,000	1,450,000 - 1,575,000	- 153,000	2.0" Snow
7	1,486,000	1,504,000 - 1,629,000	- 143,000	0.5" Snow
8	1,442,000	1,373,000 - 1,498,000	- 76,000	0.1" Rain
9	1,476,000	1,325,000 - 1,450,000	+ 26,000	
10	2,697,000	1,347,000 - 1,472,000	+ 1,225,000	2.2" Rain
11	3,146,000	1,340,000 - 1,465,000	+ 1,681,000	0.1" Rain
12	2,848,000	1,314,000 - 1,439,000	+ 1,409,000	
13	3,413,000	1,478,000 - 1,603,000	+ 1,810,000	0.9" Rain
14	3,044,000	1,538,000 - 1,663,000	+ 1,381,000	
15	2,555,000	1,367,000 - 1,492,000	+ 1,063,000	
16	2,820,000	1,358,000 - 1,483,000	+ 1,337,000	0.8" Rain
17	3,106,000	1,401,000 - 1,526,000	+ 1,580,000	
18	2,489,000	1,312,000 - 1,437,000	+ 1,052,000	
19	2,631,000	1,286,000 - 1,411,000	+ 1,220,000	1.0" Rain
20	3,063,000	1,251,000 - 1,376,000	+ 1,687,000	0.2" Rain
21	3,156,000	1,546,000 - 1,673,000	+ 1,483,000	0.2 Rain
22	2,707,000	1,365,000 - 1,490,000	+ 1,217,000	
23	2,515,000	1,470,000 - 1,595,000	+ 920,000	
24	2,416,000	1,340,000 - 1,465,000	+ 951,000	
25	1,959,000	1,335,000 - 1,460,000	+ 499,000	
26	1,773,000	1,275,000 - 1,400,000	+ 373,000	0.3 Rain
27	2,100,000	1,354,000 - 1,479,000	+ 621,000	0.3 Rain
28	2,199,000	1,446,000 - 1,571,000	+ 628,000	0.5 Snow
29	2,227,000	1,361,000 - 1,486,000	+ 741,000	
30	2,045,000	1,296,000 - 1,421,000	+ 624,000	
31				

1 10 HAMMOND
11 GARY-HOBART.

MONTHLY INFILTRATION

MONTH — DECEMBER 1988

+ 125,000 - WELL - PACKER

DATE	TO HAMMOND	FROM GARY HOBART	INFILTRATION	
	1,928,000	1,388,000 - 1,513,000	+ 415,000	0.2" [illegible]
	1,754,000	1,323,000 - 1,448,000	+ 406,000	
	1,755,000	1,305,000 - 1,430,000	+ 425,000	
	1,730,000	1,416,000 - 1,541,000	+ 289,000	
5	1,793,000	1,441,000 - 1,566,000	+ 227,000	
6	1,780,000	1,402,000 - 1,527,000	+ 253,000	
7	1,783,000	1,322,000 - 1,447,000	+ 336,000	
8	1,657,000	1,360,000 - 1,485,000	+ 172,000	
9	1,736,000	1,335,000 - 1,460,000	+ 276,000	
10	1,699,000	1,228,000 - 1,353,000	+ 346,000	1.0" Snow
11	1,544,000	1,423,000 - 1,548,000	- 4,000	1.0" Snow
12	1,476,000	1,469,000 - 1,594,000	- 118,000	2.0" Snow
13	1,592,000	1,386,000 - 1,511,000	+ 81,000	1.0" Snow
14	1,550,000	1,389,000 - 1,514,000	+ 36,000	
15	1,538,000	1,378,000 - 1,503,000	+ 35,000	
16	1,476,000	1,364,000 - 1,489,000	- 13,000	
17	1,535,000	1,367,000 - 1,492,000	+ 43,000	1.0" Snow
18	1,423,000	1,408,000 - 1,533,000	- 110,000	0.25" Snow
19	1,387,000	1,528,000 - 1,653,000	- 266,000	
20	1,552,000	1,396,000 - 1,521,000	+ 31,000	0.1" Rain
21	1,505,000	1,423,000 - 1,548,000	- 43,000	
22	1,426,000	1,280,000 - 1,405,000	- 21,000	
23	2,585,000	1,376,000 - 1,501,000	+ 1,084,000	1.5" Rain
24	2,616,000	1,456,000 - 1,581,000	+ 1,035,000	
25	2,326,000	1,466,000 - 1,591,000	+ 735,000	
26	1,818,000	1,220,000 - 1,345,000	+ 473,000	7.0" Snow
27	2,066,000	1,423,000 - 1,548,000	+ 518,000	.5" Rain
28	3,476,000	1,400,000 - 1,525,000	+ 1,951,000	.4" Rain
29	3,005,000	1,418,000 - 1,543,000	+ 1,462,000	
30	2,521,000	1,371,000 - 1,496,000	+ 1,025,000	
31	2,223,000	1,422,000 - 1,547,000	+ 676,000	

Month JANUARY – 1989

+-125,000-well (Packenge inc.)

Date	To Hammond	From Gary-Hobart	Infiltration	
1	1,9[illegible],000	1,405,000-1,530,000	+391,000	
[illegible]	1,6[illegible],000	1,284,000-1,409,000	+204,000	
[illegible]	1,7[illegible],000	1,422,000-1,547,000	+156,000	
[illegible]	1,5[illegible],000	1,413,000-1,538,000	+229,000	
5	1,820,000	1,373,000-1,496,000	+322,000	
6	2,621,000	1,410,000-1,535,000	+1,086,000	0.8" [illegible]
7	2,876,000	1,242000-1,367,000	+1,509,000	0.1" [illegible]
8	3,376,000	1,425,000-1,550,000	+1,826,000	
9	2,876,000	1,503,000-1,628,000	+1,248,000	
10	2,445,000	1,362,000-1,487,000	+ 958,000	
11	2,239,000	1,346,000-1,471,000	+ 768,000	
12	2,443,000	1,366,000-1,491,000	+ 952,000	0.2" Rai[illegible]
13	2,321,000	1,317,000-1,442,000	+ 879,000	
14	2,031,000	1,340,000-1,465,000	+ 566,000	1.2" Sno[illegible]
15	2,026,000	1,451,000-1,576,000	+ 450,000	
16	1,910,000	1,481,000-1,606,000	+ 304,000	
17	1,911,000	1,422,000-1,547,000	+ 364,000	
18	1,872,000	1,371,000-1,496,000	+ 376,000	
19	1,826,000	1,361,000-1,486,000	+ 340,000	
20	1,854,000	1,376,000-1,501,000	+ 353,000	
21	1,853,000	1,319,000-1,444,000	+ 409,000	
22	1,861,000	1,396,000-1,521,000	+ 340,000	
23	1,823,000	1,511,000-1,636,000	+ 187,000	
24	1,760,000	1,372,000-1,497,000	+ 263,000	
25	1,850,000	1,363,000-1,488,000	+ 362,000	
26	2,024,000	1,330,000-1,455,000	+ 569,000	0.3" Rain
27	2,092,000	1,335,000-1,460,000	+ 632,000	
28	1,901,000	1,325,000-1,450,000	+ 451,000	
29	1,842,000	1,372,000-1,497,000	+ 345,000	0.3" Rain
30	1,990,000	1,488,000-1,613,000	+ 377,000	0.1" Rain
31	2,030,000	1,336,000-1,461,000	+ 569,000	

MONTH FEBRUARY - '89

+-125,000 - WELL (PACKAGEING)

DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION	
	1 90,000	1,340,000 - 1,465,000	+525,000	
	1 36,000	1,294,000 - 1,419,000	+467,000	.05" -
	1, 33,000	1,292,000 - 1,417,000	+416,000	1.5" -
	1, 08,000	1,346,000 - 1,471,000	+237,000	5.0" -
5	1,608,000	1,352,000 - 1,477,000	+131,000	6.0" - SNOW
6	1,648,000	1,450,000 - 1,575,000	+73,000	3.0" - SNOW
7	1,680,000	1,332,000 - 1,457,000	+223,000	
8	1,670,000	1,367,000 - 1,492,000	+178,000	
9	1,634,000	1,279,000 - 1,404,000	+230,000	
10	1,621,000	1,407,000 - 1,532,000	+89,000	
11	1,613,000	1,283,000 - 1,408,000	+205,000	
12	1,508.000	1,362,000 - 1,487,000	+21,000	
13	1,502,000	1,464,000 - 1,589,000	(-87,000)	2.0" SNOW
14	1,627,000	1,375,000 - 1,500,000	+127,000	
15	1,559,000	1,320,000 - 1,445,000	+114,000	1.0" SNOW
16	1,627,000	1,345,000 - 1,510,000	+117,000	0.7" SNOW & RAIN
17	1,663,000	1,310,000 - 1,435,000	+228,000	
18	1,701,000	1,239,000 - 1,364,000	+337,000	
19	1,680,000	1,464,000 - 1,589,000	+91,000	
20	1,670,000	1,442,000 - 1,567,000	+103,000	0.8" SNOW
21	1,746,000	1,414,000 - 1,539,000	+207,000	
22	1,746,000	1,372,000 - 1,497,000	+249,000	
23	1,726,000	1,378,000 - 1,503,000	+223,000	12.0" SNOW
24	1,680,000	1,324,000 - 1,449,000	+231,000	
25	1,711,000	1,355,000 - 1,480,000	+231,000	
26	1,893,000	1,366,000 - 1,491,000	+402,000	0.2" SNOW
27	1,937,000	1,416,000 - 1,541,000	+396,000	
28	1,990,000	1,337,000 - 1,462,000	+528,000	0.3" SNOW
29				
30				
31				

TOTAL { 0.5" RAIN
22.0" SNOW

MONTH- MARCH - 1989

+-125,000-WELL (PACKAGEING)

DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION	
1	1,959,000	1,416,000 - 1,541,000	+ 418,000	
2	1,934,000	1,313,000 - 1,438,000	+ 496,000	
3	1,894,000	1,340,000 - 1,465,000	+ 429,000	
4	2,153,000	1,317,000 - 1442,000	+ 711,000	0.4 [illegible]
5	3,192,000	1437,000 - 1552,000	+ 1,640,000	0.2 [illegible]
6	2961,000	1441,000 - 1566,000	+ 1395,000	0.2 Rain
7	2635,000	1464,000 - 1589,000	+ 1,106,000	
8	2578,000	1390,000 1515,000	+ 1,063,000	
9	2414,000	1357,000 1482,000	+ 932,000	
10	2739,000	1377,000 1,502,000	+ 1,227,000	
11	3,140,000	1,334,000 1459,000	+ 1681,000	
12	3,138,000	1,419000 1,544,000	+ 1594,000	
13	2,946,000	1,555000 1,680,000	+ 1,266,000	
14	2763,000	1356,000 1481,000	+ 1,282,000	
15	1875,000	1330,000 1,445,000	+ 1430,000	
16	2672,000	1373,000 1,498,000	+ 1,174,000	
17	2498,000	1397,000 1,522,000	+ 976,000	
18	3045,000	1320,000 1445,000	+ 1600,000	0.8 Rain 0.3 Snow
19	2945,000	1346,000 1471000	+ 1474,000	
20	2548,000	1500,000 1625000	+ 923,000	0.1 Rain
21	2671,000	1395000 1520000	+ 1151,000	0.2 Rain 1.0 snow
22	2611,000	1432,000 1557000	+ 1054,000	
23	2421,000	1363,000 1488000	+ 933,000	
24	2,295,000	1,340,000-1,465,000	+ 830,000	
25	2,116,000	1,313,000-1,438,000	+ 678,000	
26	1,895,000	1,481,000-1,606,000	+ 289,000	
27	1,676,000	1,355,000-1,480,000	+ 196,000	
28	1,869,000	1,428,000-1,553,000	+ 316,000	0.4" Rain
29	2953,000	1,340,000-1,465,000	+ 1,488,000	0.7 Rain
30	2[illegible]000	1414000 1539000	1,391,000	
31				

Month APRIL - 1988

+-125,000-WELL (PACKAGEING)

DATE	To HAMMOND	From GARY-HOBART	INFILTRATION	
1	2,449,000	1,391,000-1,516,000	+933,000	
2	2,154,000	1,312,000-1,437,000	+717,000	
3	2,674,000	1,442,000-1,567,000	+1,107,000	0.8" RAIN
4	3,080,000	1,380,000-1,505,000	+1,575,000	0.5" RAIN
5	3,024,000	1,395,000-1,520,000	+1,504,000	0.2" RAIN
6	2,672,000	1,368,000-1,493,000	+1,179,000	0.1" RAIN
7	2,664,000	1,363,000-1,488,000	+1,176,000	
8	2,493,000	1,369,000-1,494,000	+999,000	
9	2,282,000	1,401,000-1,526,000	+756,000	0.2" RAIN
10	2,018,000	1,490,000-1,615,000	+403,000	
11	2,147,000	1,400,000-1,525,000	+622,000	
12	2,069,000	1,373,000-1,498,000	+571,000	
13	2,010,000	1,336,000-1,461,000	+549,000	
14	1,938,000	1,346,000-1,471,000	+467,000	
15	1,888,000	890,000 } GARY-HOBART METER	MALFUNCTION REPORTED TO GARY-HOBART 4-17-89 1:30 P.M. C. Nordloff	
16	1,759,000	119,000 }		0.1" RAIN
17	1,827,000	141,000 }		
18	1,970,000	1,288,000-1,413,000	+557,000	0.3" RAIN
19	2,143,000	1,336,000-1,461,000	+682,000	0.4" RAIN
20	2,020,000	1,440,000-1,565,000	+455,000	
21	1,937,000	1,350,000-1,475,000	+462,000	
22	1,870,000	1,402,000-1,527,000	+343,000	
23	1,876,000	1,467,000-1,592,000	+284,000	
24	1,864,000	1,628,000-1,753,000	+111,000	
25	1,834,000	1,575,000-1,700,000	+134,000	
26	1,967,000	1,444,000-1,569,000	+398,000	
27	1,797,000	1,502,000-1,627,000	+170,000	
28	1,908,000	1,418,000-1,543,000	+365,000	0.5" RA
29	2,050,000	1,348,000-1,473,000	+577,000	
30	1,805,000	1,476,000-1,603,000	+202,000	

89

Month MAY - 1988

+-125,000-WELL (PACKAGE INC)

	DATE	To HAMMOND	From GARY-HOBART	INFILTRATION
	1	1,805,000	1,655,000 - 1,780,000	+25,000
0.2"	2	1,715,000	1,373,000 - 1,498,000	+217,000
0.15"	3	1,807,000	1,390,000 - 1,515,000	+292,000
	4	1,610,000	1,405,000 - 1,530,000	+ 80,000
0.3" RAIN	5	1,654,000	1,386,000 - 1,511,000	+143,000
	6	1,500,000	1,426,000 - 1,551,000	(-51,000)
0.5" WATER (SNOW)	7	1,544,000	1,446,000 - 1,571,000	(-27,000)
	8	1,816,000	1,515,000 - 1,640,000	+176,000
.3" RAIN	9	1,873,000	1,505,000 - 1,630,000	+243,000
	10	1,658,000	1,380,000 - 1,505,000	+153,000
	11	1,550,000	1,550,000 - 1,675,000	(-125,000)
	12	1,524,000	1,411,000 - 1,536,000	(-12,000)
0.1" RAIN	13	1,403,000	1,431,000 - 1,556,000	(-153,000)
0.1" RAIN	14	1,485,000	1,375,000 - 1,500,000	(-15,000)
	15	1,548,000	1,655,000 - 1,780,000	(-232,000)
	16	1,526,000	1,590,000 - 1,715,000	(-189,000)
	17	1,614,000	1,687,000 - 1,812,000	(-198,000)
	18	1,495,000	1,791,000 - 1,916,000	(-421,000)
0.1" RAIN	19	1,451,000	1,513,000 - 1,638,000	(-187,000)
0.2" RAIN	20	2,274,000	1,380,000 - 1,505,000	+769,000
	21	1,863,000	1,546,000 - 1,671,000	+192,000
	22	1,766,000	1,818,000 - 1,943,000	(-177,000)
	23	1,820,000	1,601,000 - 1,726,000	+94,000
	24	1,698,000	1,740,000 - 1,865,000	(-167,000)
1.5" RAIN	25	1,787,000	1,529,000 - 1,654,000	+133,000
0.2" RAIN	26	2,637,000	1,647,000 - 1,772,000	+865,000
	27	1,856,000	1,559,000 - 1,684,000	+172,000
	28	1,598,000	1,591,000 - 1,716,000	(-118,000)
1.5" RAIN	29	1,593,000	1,524,000 - 1,649,000	(-56,000)
1.0" RAIN	30	2,918,000	1,492,000 - 1,617,000	+1,301,000
0.3" RAIN	31	2,653,000	1,652,000 - 1,777,000	+876,000

MONTH JUNE - 1989

+-125,000 - WELL (PACKAGEING)

DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION
1	TWO DAY READINGS		
2	6,566,000	3,007,000 = 3,257,000	+ 3,309,000
3	3,264,000	1,497,000 = 1,622,000	+ 1,642,000
4	3,272,000	1,584,000 = 1,709,000	+ 1,563,000
5	3,311,000	1,773,000 = 1,898,000	+ 1,413,000
6	3,236,000	1,593,000 = 1,718,000	+ 1,518,000
7	3,170,000	1,668,000 = 1,793,000	+ 1,377,000
8	3,053,000	1,784,000 = 1,909,000	+ 1,144,000
9	3,110,000	1,670,000 = 1,795,000	+ 1,315,000
10	2988,000	1,561,000 = 1686,000	1,233,000
11	2,336,000	1,465,000 = 1590,000	746,000
12	2,348000	1,773,000 = 1898000	+ 450,000
13	2974,000	1483000 = 1608000	+ 1,366,000
14	2757,000	1448,000 = 1573000	+ 1,184,000
15	2,535,000	1,533,000 = 1,658,000	+ 877,000
16	2,246,000	1,480,000 = 1,605,000	+ 641,000
17	2,221,000	1,464,000 = 1,589,000	+ 632,000
18	2,144,000	1,622,000 = 1,747,000	+ 397,000
19	1,907,000	1,708,000 = 1,833,000	+ 74,000
20	2,054,000	1,791,000 = 1,916,000	+ 138,000
21	2,109,000	1,812,000 = 1,937,000	+ 172,000
22	2,095,000	1,884,000 = 2,009,000	+ 86,000
23	1,918,000	1,907,000 = 2,032,000	(- 114,000)
24	1,835,000	1,987,000 = 2,162,000	(-274,000)
25	1,635,000	2,075,000 = 2,200,000	(-565,000)
26	1,806,000	2,259,000 = 2,384,000	(-578,000)
27	1,809,000	1,963,000 = 2,078,000	(-269,000)
28	1.784,000	1,480,000 = 1,605,000	+ 179,000
29	1,594,000	1,612,000 = 1,737,000	(-143,000)
30	1,583,000	1,633,000 = 1,758,000	(-175,000)
31			

7.3" RAIN

2.9"

0.7" RAIN

0.4" RAIN

1" RAIN

.3" RAIN

3.6" RAIN

0.3" RAIN

Month JULY – 1989

± 125,000 - WELL (PACKAGEING)

	DATE	To HAMMOND	From GARY-HOBART	INFILTRATION
	1	1,610,000	1,960,000 – 2,085,000	(-475,000)
	2	1,477,000	2,210,000 – 2,335,000	(-858,000)
	3	1,340,000	1,936,000 – 2,061,000	(-721,000)
	4	1,206,000	2,033,000 – 2,158,000	(-952,000)
	5	878,000	2,150,000 – 2,275,000	(-1,397,000)
	6	1,255,000	2,300,000 – 2,425,000	(-1,170,000)
	7	1,196,000	2,393,000 – 2,518,000	(-1,322,000)
	8	1,264,000	2,488,000 – 2,613,000	(-1,349,000)
	9	1,255,000	2,750,000 – 2,875,000	(-1,620,000)
	10	1,007,000	2,727,000 – 2,852,000	(-1,845,000)
	11	1,225,000	2,765,000 – 2,890,000	(-1,665,000)
0.8" RAIN	12	1,508,000	2,150,000 – 2,275,000	(-767,000)
	13	1,415,000	1,509,000 – 1,634,000	(-219,000)
	14	1,353,000	1,742,000 – 1,837,000	(-484,000)
	15	1,033,000	1,878,000 – 2,003,000	(-970,000)
	16	1,289,000	1,985,000 – 2,110,000	(-821,000)
	17	1,220,000	2,462,000 – 2,587,000	(1,367,000)
	18	1,363,000	2,246,000 – 2,371,000	(1,008,000)
3.1" - RAIN	19	2,397,000	1,660,000 – 1,785,000	+ 612,000
0.6" - RAIN	20	2,360,000	1,448,000 – 1,573,000	+ 787,000
1.2" - RAIN	21	3,434,000	1,460,000 – 1,585,000	+1,849,000
0.2" - RAIN	22	2,782,000	1,459,000 – 1,584,000	+1,198,000
	23	2,137,000	1,587,000 – 1,712,000	+ 425,000
	24	1,933,000	1,709,000 – 1,834,000	+ 99,000
0.1" - RAIN	25	1,931,000	1,860,000 – 1,985,000	(-54,000)
	26	1,864,000	1,737,000 – 1,862,000	+ 2,000
	27	1,626,000	1,748,000 – 1,873,000	(-247,000)
	28	1,600,000	1,822,000 – 1,947,000	(-347,000)
	29	1,645,000	1,813,000 – 1,938,000	(-293,000)
1.0" - RAIN	30	1,892,000	1,816,000 – 1,941,000	(-49,000)
	31	1,657,000	1,604,000 – 1,729,000	(-72,000)

Month AUGUST - 1989

± 125,000 - WELL (PACKAGEING)

	DATE	To HAMMOND	From GARY-HOBART	INFILTRATION
	1	1,627,000	1,680,000 - 1,805,000	(-178,000)
	2	1,538,000	1,739,000 - 1,864,000	(-326,000)
	3	1,382,000	1,841,000 - 1,966,000	(-584,000)
	4	1,415,000	1,921,000 - 2,046,000	(-631,000)
4" RAIN	5	1,422,000	1,922,000 - 2,047,000	(-625,000)
	6	1,356,000	1,607,000 - 1,732,000	(-376,000)
	7	1,250,000	1,680,000 - 1,805,000	(-555,000)
	8	1,152,000	1,650,000 - 1,775,000	(-623,000)
" RAIN	9	1,289,000	1,732,000 - 1,857,000	(-568,000)
" RAIN	10	1,456,000	1,554,000 - 1,679,000	(-223,000)
	11	1,222,000	1,514,000 - 1,639,000	(-417,000)
	12	1,596,000	1,620,000 - 1,745,000	(-149,000)
	13	1,467,000	1,619,000 - 1,744,000	(-277,000)
	14	1,153,000	1,931,000 - 2,056,000	(-903,000)
5" RAIN	15	1,647,000	1,563,000 - 1,688,000	(-41,000)
" RAIN	16	1,425,000	1,480,000 - 1,605,000	(-180,000)
	17	1,252,000	1,531,000 - 1,656,000	(-404,000)
	18	1,294,000	1,570,000 - 1,695,000	(-401,000)
	19	1,260,000	1,598,000 - 1,723,000	(-463,000)
5" RAIN	20	1,361,000	1,697,000 - 1,822,000	(-461,000)
	21	1,258,000	1,612,000 - 1,737,000	(-479,000)
	22	1,390,000	1,610,000 - 1,735,000	(-345,000)
7" RAIN	23	1,531,000	1,527,000 - 1,652,000	(-121,000)
2" RAIN	24	1,341,000	1,491,000 - 1,616,000	(-275,000)
	25	1,309,000	1,472,000 - 1,597,000	(-288,000)
	26	1,291,000	1,541,000 - 1,666,000	(-375,000)
	27	1,364,000	1,600,000 - 1,725,000	(-361,000)
	28	1,374,000	1,895,000 - 2,020,000	(-646,000)
2.2" RAIN	29	1,406,000	1,610,000 - 1,735,000	(-329,000)
2.1" RAIN	30	1,372,000	1,655,000 - 1,780,000	(-408,000)
	31	1,249,000	1,589,000 - 1,714,000	(-465,000)

MONTH SEPT. 89

+-125,000-WELL (PACKAGE INC)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRATION
3.1"-RAIN	1	1,635,000	1,444,000-1,569,000	+66,000
0.1"-RAIN	2	3,024,000	1,348,000-1,473,000	+1,551,000
	3	2,078,000	1,654,000-1,779,000	+ 299,000
	4	1,506,000	1,368,000-1,493,000	+ 13,000
	5	1,359,000	1,575,000-1,700,000	(-341,000)
0.2"-RAIN	6	1,476,000	1,533,000-1,658,000	(-182,000)
[illegible]"-RAIN	7	2,307,000	1,524,000-1,649,000	+ 658,000
0.2"-RAIN	8	2,185,000	1,410,000-1,535,000	+ 650,000
0.1"-RAIN	9	2,180,000	1,392,000-1,517,000	+ 663,000
0.2"-RAIN	10	2,570,000	1,411,000-1,536,000	+1,034,000
	11	2,009,000	1,600,000-1,725,000	+ 284,000
	12	1,758,000	1,509,000-1,634,000	+ 124,000
0.7"-RAIN	13	1,948,000	1,381,000-1,506,000	+ 442,000
0.7"-RAIN	14	2,582,000	1,380,000-1,505,000	+1,077,000
0.1"-RAIN	15	2,405,000	1,420,000-1,545,000	+ 860,000
	16			
	17			
	18			
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MONTH SEPT. 89

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
3.1"-RAIN	1	1,635,000	1,444,000-1,569,000	+[illegible]
0.1"-RAIN	2	3,024,000	1,348,000-1,473,000	+ 1,551.0[illegible]
	3	2,078,000	1,654,000-1,779,000	+ 299.0
	4	1,506,000	1,318,000-1,493,000	+ 13.0
	5	1,359,000	1,575,000-1,700,000	(-341.0
0.2"-RAIN	6	1,476,000	1,533,000-1,658,000	(-[illegible]
1.0"-RAIN	7	2,307,000	1,534,000-1,649,000	+ 1,58[illegible]
0.2"-RAIN	8	2,185,000	1,410,000-1,535,000	+ 1,50.0
0.1"-RAIN	9	2,180,000	1,392,000-1,517,000	+ [illegible]
0.2"-RAIN	10	2,570,000	1,411,000-1,536,000	+ 1,0[illegible]
	11	2,009,000	1,600,000-1,725,000	+ 284.0
	12	1,758,000	1,509,000-1,634,000	+ 124,0[illegible]
0.7"-RAIN	13	1,948,000	1,381,000-1,506,000	+ 442.0
0.7"-RAIN	14	2,582,000	1,380,000-1,505,000	+1,077.0[illegible]
0.1"-RAIN	15	2,405,000	1,420,000-1,545,000	+ 260.0
	16	2,213,000	1,380,000-1,505,000	+ 708.[illegible]
	17	1,907,000	1,454,000-1,579,000	+ 328.0
	18	1,902,000	1,660,000-1,785,000	+ 117.0[illegible]
	19	1,758,000	1,490,000-1,615,000	+ 143.00
	20	1,592,000	1,487,000-1,612,000	(-20.0[illegible]
	21	1,593,000	1,510,000-1,635,000	(-42.0[illegible]
	22	1,533,000	1,515,000-1,640,000	(-107.0[illegible]
	23	1,441,000	1,318,000-1,443,000	(- 2.00
	24	1,578,000	1,516,000-1,641,000	(-63.00
	25	1,487,000	1,618,000-1,743,000	(-256.0[illegible]
	26	1,301,000	1,540,000-1,665,000	(-364.00
	27	778,000	1,564,000-1,689,000	(-911.0[illegible]
	28	708,000	1,515,000-1,640,000	(-932.00
	29	646,000	1,564,000-1,689,000	(-1,043.0[illegible]
	30	1,274,000	1,464,000-1,579,000	(-305.0[illegible]
	31			

MONTH OCT. - 89

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,295,000	1,688,000-1,813,000	(-51?,
	2	1,318,000	1,711,000-1,831,000	(-51?,
	3	1,340,000	1,583,000-1,708,000	(-3?,
	4	1,200,000	1,535,000-1,660,000	(-4?,
	5	1,257,000	1,497,000-1,622,000	(-365,
0.3" RAIN	6	1,300,000	1,380,000-1,505,000	(-205,
	7	1,251,000	1,395,000-1,520,000	(-269,
	8	1,252,000	1,621,000-1,746,000	(-?
	9	1,248,000	1,558,000-1,683,000	(-?
"T"-RAIN	10	1,306,000	1,511,000-1,636,000	(-?
	11	1,141,000	1,400,000-1,525,000	(-384,
	12	1,147,000	1,500,000-1,625,000	(-47?,
	13	1,127,000	1,510,000-1,635,000	(-508,
	14	1,116,000	1,450,000-1,575,000	(-459,
	15	1,111,000	1,479,000-1,604,000	(-493,
	16	1,201,000	1,6666,000-1,791,000	(-590,
0.8"-RAIN	17	1,240,000	1,442,000-1,567,000	(-327,
0.2"-RAIN	18	1,304,000	1,390,000-1,515,000	(-211,
0.1"-RAIN	19	1,147,000	1,488,000-1,613,000	(-41?,
1.8" {RAIN SNOW	20	1,620,000	1,395,000-1,520,000	+100,
0.3"-RAIN	21	1,667,000	1,398,000-1,523,000	+144,
	22	1,542,000	1,401,000-1,526,000	+ 16,
	23	1,460,000	1,486,000-1,611,000	(-151,
	24	1,457,000	1,471,000-1,596,000	(-139,
	25	1,422,000	1,412,000-1,537,000	(-115,
	26	1,382,000	1,506,000-1,633,000	(-251,
	27	1,361,000	1,414,000-1,539,000	(-17?,
	28	1,330,000	1,379,000-1,504,000	(-17?,
	29	1,349,000	1,492,000-1,617,000	(-268,
	30	1,321,000	1,548,000-1,673,000	(-352,
	31	1,372,000	1,628,000-1,753,000	(-321,

MONTH NOV. 1989

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,251,000	1,313,000-1,438,000	(-1
	2	1,274,000	1,437,000-1,562,000	(-2
	3	1,201,000	1,466,000-1,591,000	(-3
	4	1,173,000	1,379,000-1,504,000	(-331,
	5	1,199,000	1,363,000-1,488,000	(-289,
0.1" RAIN	6	1,283,000	1,584,000-1,709,000	(-426,
0.05" RAIN	7	1,294,000	1,415,000-1,540,000	(-246,
	8	1,250,000	1,426,000-1,551,000	(-301,
	9	1,180,000	1,451,000-1,576,000	(-396,
0.1"-RAIN	10	1,131,000	1,339,000-1,464,000	(-332,
0.05"-RAIN	11	1,122,000	1,356,000-1,481,000	(-359,
	12	1,149,000	1,440,000-1,565,000	(-416,
	13	1,159,000	1,537,000-1,662,000	(-503,
	14	1,130,000	1,464,000-1,589,000	(-459,
1.4" RAIN	15	1,576,000	1,380,000-1,505,000	+
1.5" RAIN	16	2,906,000	1,364,000-1,489,000	+ 1,41
	17	2,382,000	1,400,000-1,525,000	+857,
	18	1,953,000	1,321,000-1,446,000	+507,
	19	1,820,000	1,421,000-1,546,000	+274,
	20	1,957,000	1,629,000-1,754,000	+203,
	21	1,799,000	1,403,000-1,528,000	+271,
	22	1,737,000	1,445,000-1,570,000	+167,
8.0"-SNOW	23	1,696,000	1,346,000-1,471,000	+225,
	24	1,417,000	1,468,000-1,593,000	(-31
	25	1,636,000	1,423,000-1,548,000	+ 88,
	26	1,821,000	1,401,000-1,526,000	+295,
	27	1,861,000	1,512,000-1,637,000	+224,
0.2"-RAIN	28	1,900,000	1,350,000-1,475,000	+425,
	29	1,814,000	1,361,000-1,486,000	+328,
	30	1,683,000	1,300,000-1,425,000	+258,
	31			

MONTH DEC. - 1989

+-125,000 - WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,642,000	1,566,000 - 1,691,000	- [illegible]
	2	1,640,000	1,456,000 - 1,581,000	+ 59,
	3	1,576,000	1,310,000 - 1,435,000	+ 141,
	4	1,626,000	1,536,000 - 1,661,000	- 35,
	5	1,655,000	1,446,000 - 1,571,000	+ 84,
	6	1,593,000	1,359,000 - 1,484,000	+ 109,
	7	1,488,000	1,385,000 - 1,510,000	- 22,
1.0" - SNOW	8	1,469,000	1,460,000 - 1,585,000	- 116,
	9	1,595,000	1,357,000 - 1,482,000	+ 113,
	10	1,461,000	1,379,000 - 1,504,000	- [illegible]
4.0" SNOW	11	1,457,000	1,512,000 - 1,637,000	- 180,
	12	1,427,000	1,400,000 - 1,525,000	- 98,
	13	1,306,000	1,393,000 - 1,518,000	- 212,
1.75" SNOW	14	1,344,000	1,415,000 - 1,540,000	- 196,
	15	1,329,000	1,498,000 - 1,623,000	- 294,
	16	1,222,000	1,315,000 - 1,440,000	- 218,
	17	1,212,000	1,432,000 - 1,557,000	- 345,
	18	1,281,000	1,582,000 - 1,707,000	- 426,
2.0" SNOW	19	1,292,000	1,398,000 - 1,523,000	- 231,
1.0" SNOW	20	1,242,000	1,478,000 - 1,603,000	- 361,
1.0" SNOW	21	1,213,000	1,403,000 - 1,528,000	- 315,
	22	1,161,000	1,426,000 - 1,551,000	- 390,
	23	1,144,000	1,460,000 - 1,585,000	- 441,
	24	1,261,000	1,538,000 - 1,663,000	- 402,
	25	1,151,000	1,450,000 - 1,575,000	- 424,
1.0" SNOW	26	1,022,000	1,448,000 - 1,573,000	- 551,
0.5" SNOW	27	1,115,000	1,500,000 - 1,625,000	- 510,
	28	1,193,000	1,543,000 - 1,668,000	- 475,
	29	835,000	1,436,000 - 1,561,000	- 726,
0.1" - RAIN	30	1,259,000	1,421,000 - 1,546,000	- 287,
	31	1,295,000	1,450,000 - 1,575,000	- 280,

MONTH JAN-1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,316,000	1,500,000-1,625,000	- 30[illegible]
	2	1,168,000	1,460,000-1,585,000	- 417,00
	3	1,242,000	1,519,000-1,641,000	- 402,0[illegible]
0.55" RAIN	4	1,628,000	1,423,000-1,548,000	+ 80,0
0.2" RAIN	5	1,912,000	1,435,000-1,560,000	+ 352,0[illegible]
	6	1,720,000	1,449,000-1,574,000	+ 146,0
	7	1,686,000	1,441,000-1,566,000	+ 120,0[illegible]
	8	1,629,000	1,600,000-1,725,000	- 96,0[illegible]
	9	1,717,000	1,373,000-1,498,000	+ 219,0
0.2" RAIN	10	1,707,000	1,540,000-1,665,000	+ 42,0[illegible]
	11	1,771,000	1,470,000-1,595,000	+ 176,0[illegible]
	12	1,629,000	1,445,000-1,570,000	+ 59,0[illegible]
	13	1,519,000	1,387,000-1,512,000	+ 7,0[illegible]
	14	1,584,000	1,414,000-1,539,000	+ 45,0[illegible]
	15	1,597,000	1,651,000-1,776,000	- 179,0[illegible]
	16	1,559,000	1,458,000-1,583,000	- 24,0[illegible]
0.9" RAIN	17	1,743,000	1,440,000-1,565,000	+ 178,0[illegible]
0.15" RAIN	18	2,202,000	1,407,000-1,532,000	+ 670,0[illegible]
	19	2,042,000	1,426,000-1,551,000	+ 491,0[illegible]
0.1" RAIN	20	1,799,000	1,420,000-1,545,000	+ 254,0[illegible]
0.2" RAIN	21	1,791,000	1,344,000-1,469,000	+ 322,0[illegible]
0.1" RAIN	22	1,985,000	1,587,000-1,712,000	+ 273,0[illegible]
	23	1,935,000	1,505,000-1,630,000	+ 305,0[illegible]
	24	1,719,000	1,434,000-1,559,000	+ 160,0[illegible]
1.1" RAIN	25	2,063,000	1,404,000-1,529,000	+ 534,0[illegible]
0.3"-RAIN 0.5"-SNOW	26	3,378,000	1,440,000-1,565,000	+ 1,813,0[illegible]
	27	1,938,000	1,397,000-1,522,000	+ 416,0[illegible]
	28	2,456,000	1,380,000-1,505,000	+ 951,0[illegible]
	29	2,228,000	1,600,000-1,725,000	+ 503,0[illegible]
	30	2,140,000	1,428,000-1,553,000	+ 587,0[illegible]
	31	2,034,000	1,474,000-1,599,000	+ 435,0[illegible]

MONTH FEB. 1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
0.2" RAIN	1	1,959,000	1,372,000 = 1,497,000	+ 462,0
0.6" RAIN	2	2,541,000	1,473,000 = 1,598,000	+ 943,0
	3	2,639,000	1,375,000 = 1,500,000	+ 1,139,0
0.2" RAIN	4	2,408,000	1,374,000 = 1,499,000	+ 909,0
	5	2,235,000	1,536,000 = 1,661,000	+ 574,0
	6	2,119,000	1,322,000 = 1,447,000	+ 672,0
	7	2,101,000	1,434,000 = 1,559,000	+ 542,0
	8	2,101,000	1,414,000 = 1,539,000	+ 562,0
	9	2,053,000	1,401,000 = 1,526,000	+ 527,0
	10	1,887,000	1,378,000 = 1,503,000	+ 384,0
	11	1,747,000	1,320,000 = 1,445,000	+ 302,0
	12	1,727,000	1,527,000 = 1,652,000	+ 75,0
	13	1,740,000	1,450,000 = 1,575,000	+ 165,0
FREEZING RAIN 0.05"	14	1,607,000	1,483,000 = 1,608,000	+ 1,0
FREEZING RAIN & SNOW 5.5"	15	1,648,000	1,380,000 = 1,505,000	+ 143,0
0.15" FREEZING RAIN	16	1,644,000	1,353,000 = 1,508,000	+ 151,0
0.2" RAIN 0.3" SNOW	17	1,719,000	1,324,000 - 1,449,000	+ 270,0
	18	1,831,000	1,426,000 - 1,551,000	+ 280,0
	19	1,989,000	1,502,000 - 1,627,000	+ 362,0
	20	2,101,000	1,501,000 - 1,626,000	+ 475,0
	21	2,048,000	1,384,000 - 1,509,000	+ 539,0
0.7" - RAIN	22	2,332,000	1,316,000 - 1,491,000	+ 841,0
1.0" - RAIN 5.0" - SNOW	23	3,399,000	1,319,000 - 1,444,000	+ 1,955,0
2.0" - SNOW	24	3,787,000	1,350,000 - 1,475,000	+ 2,312,0
1.1" - SNOW	25	3,568,000	1,460,000 - 1,585,000	+ 1,983,0
	26	3,503,000	1,511,000 - 1,636,000	+ 1,867,0
	27	3,339,000	1,522,000 - 1,647,000	+ 1,692,0
	28	3,024,000	1,391,000 - 1,516,000	+ 1,508,0
	29			
	30			
	31			

MONTH - MARCH - 1990

+-125,000 - WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	3,041,000	1,449,000 - 1,574,000	+ 1,467.0
	2	2,962,000	1,482,000 - 1,607,000	+ 1,355.0
	3	2,865,000	1,350,000 - 1,475,000	+ 1,390.0
	4	2,721,000	1,516,000 - 1,641,000	+ 1,080.0
	5	2,580,000	1,562,000 - 1,687,000	+ 893.0
0.5" RAIN & SNOW	6	2,692,000	1,470,000 - 1,595,000	+ 1,097.0
	7	2,567,000	1,453,000 - 1,578,000	+ 989.0
"T" RAIN	8	2,326,000	1,383,000 - 1,508,000	+ 818.0
1.0" RAIN	9	2,941,000	1,337,000 - 1,462,000	+ 1,479.0
0.25" - RAIN	10	3,223,000	1,390,000 - 1,515,000	+ 1,708.0
0.6" RAIN	11	3,201,000	1,494,000 - 1,619,000	+ 1,582.0
0.1" RAIN	12	3,207,000	1,564,000 - 1,689,000	+ 1,518,0
	13	3,118,000	1,580,000 - 1,705,000	+ 1,413,0
	14	3,043,000	1,370,000 - 1,495,000	+ 1,548,0
	15	3,036,000	1,475,000 - 1,600,000	+ 1,436,0
	16	2,761,000	1,380,000 - 1,505,000	+ 1,256,0
	17	2,499,000	1,441,000 - 1,566,000	+ 993,0
	18	2,257,000	1,375,000 - 1,500,000	+ 757,0
0.2" RAIN & SNOW	19	2,180,000	1,548,000 - 1,673,000	+ 507,0
	20	2,174,000	1,432,000 - 1,557,000	+ 617,0
	21	2,043,000	1,461,000 - 1,586,000	+ 457,0
0.1" RAIN	22	2,100,000	1,395,000 - 1,520,000	+ 580,0
1.0" RAIN	23	3,175,000	1,464,000 - 1,589,000	+ 1,586,0
	24	2,737,000	1,360,000 - 1,485,000	+ 1,252,0
	25	2,551,000	1,496,000 - 1,621,000	+ 930,0
	26	2,491,000	1,596,000 - 1,721,000	+ 770,0
	27	2,208,000	1,342,000 - 1,467,000	+ 741,0
	28	2,164,000	1,462,000 - 1,587,000	+ 577,0
0.3" RAIN	29	2,105,000	1,410,000 - 1,535,000	+ 570,0
0.5" RAIN	30	2,528,000	1,350,000 - 1,475,000	+ 1,053,0
0.1" RAIN	31	2,518,000	1,427,000 - 1,552,000	+ 966,0

MONTH APRIL - 1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
0.2" RAIN	1	2,407,000	1,406,000-1,531,000	+ 876,0
0.4" RAIN	2	2,533,000	1,504,000-1,629,000	+ 904,0
0.1" RAIN	3	2,560,000	1,591,000-1,716,000	+ 844,0
0.15" RAIN	4	2,387,000	1,452,000-1,577,000	+ 810,0
	5	2,496,000	1,397,000-1,522,000	+ 974,0
	6	2,260,000	1,440,000-1,565,000	+ 695,0
	7	2,071,000	1,393,000-1,518,000	+ 553,0
	8	1,991,000	1,532,000-1,657,000	+ 334,0
	9	1,872,000	1,483,000-1,608,000	+ 264,0
0.6" RAIN	10	2,028,000	1,440,000-1,565,000	+ 463,0
0.2" RAIN	11	2,249,000	1,404,000-1,529,000	+ 720,0
0.4" RAIN	12	2,281,000	1,406,000-1,531,000	+ 750,0
	13	2,250,000	1,452,000-1,577,000	+ 673,0
0.8" RAIN	14	2,445,000	1,373,000-1,498,000	+ 947,0
0.1" RAIN	15	2,820,000	1,511,000-1,636,000	+ 1,184,0
	16	2,174,000	1,335,000-1,460,000	+ 714,0
0.2" RAIN	17	2,488,000	1,532,000-1,657,000	+ 831,0
	18	2,304,000	1,502,000-1,627,000	+ 677,0
	19	2,202,000	1,531,000-1,656,000	+ 546,0
0.1" RAIN	20	2,030,000	1,412,000-1,537,000	+ 493,0
1.4" RAIN	21	2,659,000	1,318,000-1,443,000	+ 1,166,0
	22	2,975,000	1,493,000-1,618,000	+ 1,357,0
	23	2,991,000	1,750,000-1,875,000	+ 1,116,0
	24	2,680,000	1,557,000-1,682,000	+ 998,0
	25	2,520,000	1,592,000-1,717,000	+ 803,0
	26	2,447,000	1,674,000-1,799,000	+ 648,0
	27	2,280,000	1,639,000-1,764,000	+ 516,0
	28	2,215,000	1,570,000-1,695,000	+ 520,0
	29	2,040,000	1,501,000-1,626,000	+ 414,0
	30	1,910,000	1,773,000-1,898,000	+ 12,0
	31			

MONTH - MAY - 1990

+-125,000 - WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	1,845,000	1,546,000 - 1,671,000	+ 174,000
	2	1,682,000	1,493,000 - 1,618,000	+ 64,000
	3	1,682,000	1,602,000 - 1,727,000	(- 45,000
1.5" - RAIN	4	1,850,000	1,560,000 - 1,685,000	+ 117,000
0.4" - RAIN	5	3,120,000	1,457,000 - 1,582,000	+ 1,538,000
	6	2,291,000	1,510,000 - 1,635,000	+ 656,000
	7	2,252,000	1,629,000 - 1,754,000	+ 498,000
	8	2,176,000	1,648,000 - 1,773,000	+ 403,000
	9	1,950,000	1,643,000 - 1,768,000	+ 182,000
2.5" - RAIN	10	2,722,000	1,570,000 - 1,695,000	+ 1,027,000
0.2" - RAIN	11	3,553,000	1,566,000 - 1,691,000	+ 1,862,000
0.7" - RAIN	12	3,725,000	1,511,000 - 1,636,000	+ 2,089,000
1.5" - RAIN	13	3,310,000	1,546,000 - 1,671,000	+ 1,639,000
	14	3,683,000	1,641,000 - 1,766,000	+ 1,917,000
0.1" - RAIN	15	3,644,000	1,593,000 - 1,718,000	+ 1,926,000
0.4" - RAIN	16	3,543,000	1,540,000 - 1,665,000	+ 1,878,000
0.5" - RAIN	17	3,551,000	1,641,000 - 1,766,000	+ 1,785,000
	18	3,499,000	1,625,000 - 1,750,000	+ 1,749,000
	19	3,375,000	1,612,000 - 1,737,000	+ 1,638,000
0.5" - RAIN	20	3,051,000	1,466,000 - 1,591,000	+ 1,460,000
	21	3,554,000	1,698,000 - 1,823,000	+ 1,731,000
	22	3,100,000	1,539,000 - 1,664,000	+ 1,436,000
	23	2,732,000	1,337,000 - 1,462,000	+ 1,270,000
	24	2,632,000	1,805,000 - 1,930,000	+ 702,000
0.1" - RAIN	25	2,540,000	1,586,000 - 1,711,000	+ 829,000
1.2" - RAIN	26	3,140,000	1,387,000 - 1,512,000	+ 1,628,000
	27	3,434,000	1,513,000 - 1,638,000	+ 1,796,000
	28	2,740,000	1,533,000 - 1,658,000	+ 1,082,000
	29	2,471,000	1,767,000 - 1,892,000	+ 579,000
	30	2,554,000	1,640,000 - 1,765,000	+ 789,000
	31	2,400,000	1,741,000 - 1,866,000	+ 534,000

TOTAL RAIN FOR MONTH = 5.6"

MONTH JUNE - 1990

+-125,000-WELL (PACKAGEING)

	DATE	TO HAMMOND	FROM GARY-HOBART	INFILTRA
	1	2,290,000	1,780,000-1,905,000	+385,0
	2	2,314,000	1,734,000-1,859,000	+355,0
	3	3,149,000	1,674,000-1,799,000	+350,0
	4	1,933,000	1,870,000-1,995,000	(-62,000
	5	1,772,000	1,761,000-1,886,000	(-114,00
0.1" RAIN	6	1,764,000	1,530,000-1,655,000	+109,00
	7	1,818,000	1,934,000-2,059,000	(-241,00
2.1" RAIN	8	2,180,000	1,808,000-1,933,000	+247,00
	9	3,153,000	1,672,000-1,797,000	+1,356,00
	10	2,430,000	1,802,000-1,927,000	+503,00
	11	2,043,000	1,924,000-2,049,000	(-6,000
	12	2,006,000	1,791,000-2,116,000	(-110,00
	13	1,934,000	2,090,000-2,215,000	(-281,00
0.8" RAIN	14	1,910,000	2,030,000-2,155,000	(-245,00
	15	1,957,000	1,684,000-1,809,000	+148,00
	16	1,622,000	1,606,000-1,731,000	(-109,00
0.3" RAIN	17	1,977,000	1,842,000-1,967,000	(-10,000
0.1" RAIN	18	1,666,000	1,864,000-1,989,000	(-323,000
	19	1,704,000	1,968,000-2,083,000	(-379,00
0.1" RAIN	20	1,690,000	1,782,000-1,907,000	(-217,000
	21	1,710,000	1,680,000-1,805,000	(-95,000
	22	1,624,000	1,734,000-1,859,000	(-235,000
0.5" RAIN	23	1,724,000	1,696,000-1,821,000	(-97,000
0.1" RAIN	24	1,655,000	1,585,000-1,710,000	(-55,000
	25	1,522,000	1,751,000-1,876,000	(-354,000
	26	1,505,000	1,867,000-1,992,000	(-487,000
0.2" RAIN	27	1,570,000	1,680,000-1,805,000	(-235,000
0.2" RAIN	28	1,563,000	1,796,000-1,921,000	(-357,00
1.0" RAIN	29	1,644,000	1,593,000-1,718,000	(-74,000
0.1" RAIN	30	1,912,000	1,602,000-1,727,000	+185,000
	31			

Month JULY - 1990

+-125,000 - WELL (PACKAGEING)

	DATE	To HAMMOND	From GARY-HOBART	INFILTRAT
0.15" RAIN	1	1,723,000	1,703,000 - 1,82[illegible].000	+ 105,[illegible]
	2	1,550,000	1,750,000 - 1,875,000	(-325,000
	3	1,587,000	1,923,000 - 2,048,000	(-461,000
	4	1,312,000	1,902,000 - 2,027,000	(-715,000
	5	1,057,000	2,226,000 - 2,351,000	(-1,294,000
	6	1,275,000	2,023,000 - 2,148,000	(-873,000
	7	1,183,000	2,007,000 - 2,132,000	(-949,000
	8	1,591,000	2,131,000 - 2,262,000	(-671,000
	9	1,296,000	2,761,000 - 2,886,000	(-1,590,000
0.7" RAIN	10	1,642,000	2,481,000 - 2,606,000	(-964,000
1.9" RAIN	11	1,880,000	1,505,000 - 1,630,000	+250,000
0.1" RAIN	12	2,346,000	1,561,000 - 1,685,000	+ 661,000
	13	1,687,000	1,555,000 - 1,680,000	+ 7,000
	14	1,612,000	1,549,000 - 1,674,000	-(-62,000)
0.2" RAIN	15	1,722,000	1,545,000 - 1,670,000	(-52,000)
0.1" RAIN	16	1,596,000	1,577,000 - 1,702,000	(-105,000
0.1" RAIN	17	1,620,000	1,716,000 - 1,841,000	(-221,000)
	18	1,576,000	1,976,000 - 2,101,000	(-525,000
0.1" RAIN	19	1,452,000	1,820,000 - 1,945,000	(-493,000
2.5" RAIN	20	2,683,000	1,513,000 - 1,938,000	+ 745,000
0.6" RAIN	21	3,095,000	1,650,000 - 1,777,000	+1,315,000
0.1" RAIN	22	2,556,000	1,539,000 - 1,664,000	+ 891,000
0.4" RAIN	23	3,097,000	1,725,000 - 1,853,000	+1,244,000
	24	2,414,000	1,697,000 - 1,822,000	+ 592,000
	25	2,457,000	1,624,000 - 1,749,000	+ 708,000
0.6" RAIN	26	2,285,000	1,670,000 - 1,795,000	+ 490,000
	27	2,061,000	1,775,000 - 1,900,000	+ 161,000
	28	1,910,000	1,807,000 - 1,932,000	(-22,000
0.2" RAIN	29	1,895,000	1,971,000 - 2,101,000	(-331,000
0.25" RAIN	30	1,983,000	1,747,000 - 1,872,000	+111,000
	31	1,885,000	1,574,000 - 1,694,000	+156,000

APPENDIX N

Wetlands Investigation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

5HS-11

August 13, 1990

REPLY TO ATTENTION OF:

Kevin Domack
Warzyn Engineering Inc.
One Science Court
Madison, WI 53711

RE: Wetlands Delineation Report
American Chemical Services NPL Site
Griffith Indiana

Dear Mr. Domack:

Enclosed please find a copy of the report titled "Wetlands Delineation at American Chemical Services Hazardous Waste Site, Griffith, Indiana IAG DW14934313-0". If you have any questions concerning the content of the report, please contact me with your question and I will put you in touch with the Fish & Wildlife biologists. My telephone number is (312) 886-5116 if you need to contact me.

Sincerely,

Robert E. Swale
Remedial Project Manager

Wetlands Delineation at American Chemical Services Hazardous Waste Site, Griffith, Indiana. IAG-DW14934313-0

Robin A. Nims
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
718 North Walnut Street
Bloomington, Indiana

May 1990

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Summary

At the request of the U.S. Environmental Protection Agency, Region V, the U.S. Fish and Wildlife Service conducted a wetlands delineation for site wetlands potentially impacted by contaminants originating at the American Chemical Services (ACS) hazardous waste site.

Office review and field surveying indicated numerous wetlands exist at the ACS site, many of which are not identified on the National Wetland Inventory. The diversity of wetland types present provide habitat for a variety of wildlife species.

INTRODUCTION

The American Chemical Services (ACS) Superfund site is located in Griffith, Indiana on the outskirts of the city's southeast side. The site was placed on the National Priorities List in 1983 as a result of investigations into chemical disposal practices on the site. ACS operates as a chemical/solvent recovery facility, which also has a limited chemical manufacturing operation. During the course of its operations, ACS dumped and otherwise disposed of unrecoverable solvents on the property, in addition to transporting waste to the adjacent Griffith City Landfill. Kapica Drum, Inc. also allegedly disposed of drum-cleaning residues on ACS property. These 3 sites total 52 acres and jointly comprise the official ACS site.

The National Wetland Inventory (Figure 1) indicates numerous and extensive wetlands within a 1-mile radius of the ACS site to the southwest, south, southeast, east, and northeast. There is an extensive wetland complex adjacent to the northwest boundary of the site. These wetlands are dissected and bordered by the Grand Trunk Western Railroad lines, the Chesapeake and Ohio Railroad lines, and the abandoned Erie-Lackawanna Railroad lines. The wetlands to the north of the Grand Trunk Western lines were not within the project boundary limits, however, they are likely hydraulically connected. The NWI map classifies this wetland complex as palustrine, emergent, semi-permanent/palustrine emergent, seasonally flooded. The entire complex is approximately 78 acres, however, only 50.5 acres were included in the present delineation.

OBJECTIVES

The objectives of this project were:

1. To ground-truth and verify wetlands delineated on the National Wetland Inventory maps.
2. To identify other wetland areas not included in the National Wetland Inventory.
3. To identify dominant vegetation in the various wetland areas.
4. To assess relative value of the various wetland habitats for fish and wildlife resources.

METHODS

The methods utilized in this delineation are outlined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989). Because of the relative homogeneity of the site, the soils assessment procedure was selected. Prior to the field work, an office review was conducted to preliminarily outline the area in question. Due to the unavailability of the most recent aerial photographs the preliminary boundaries were outlined from a 1984 photograph, obtained from the EPA project manager. Based upon the field inspection, the 1984 photograph was accurate with the exception of approximately 5 additional acres lost to the Griffith Landfill operation.

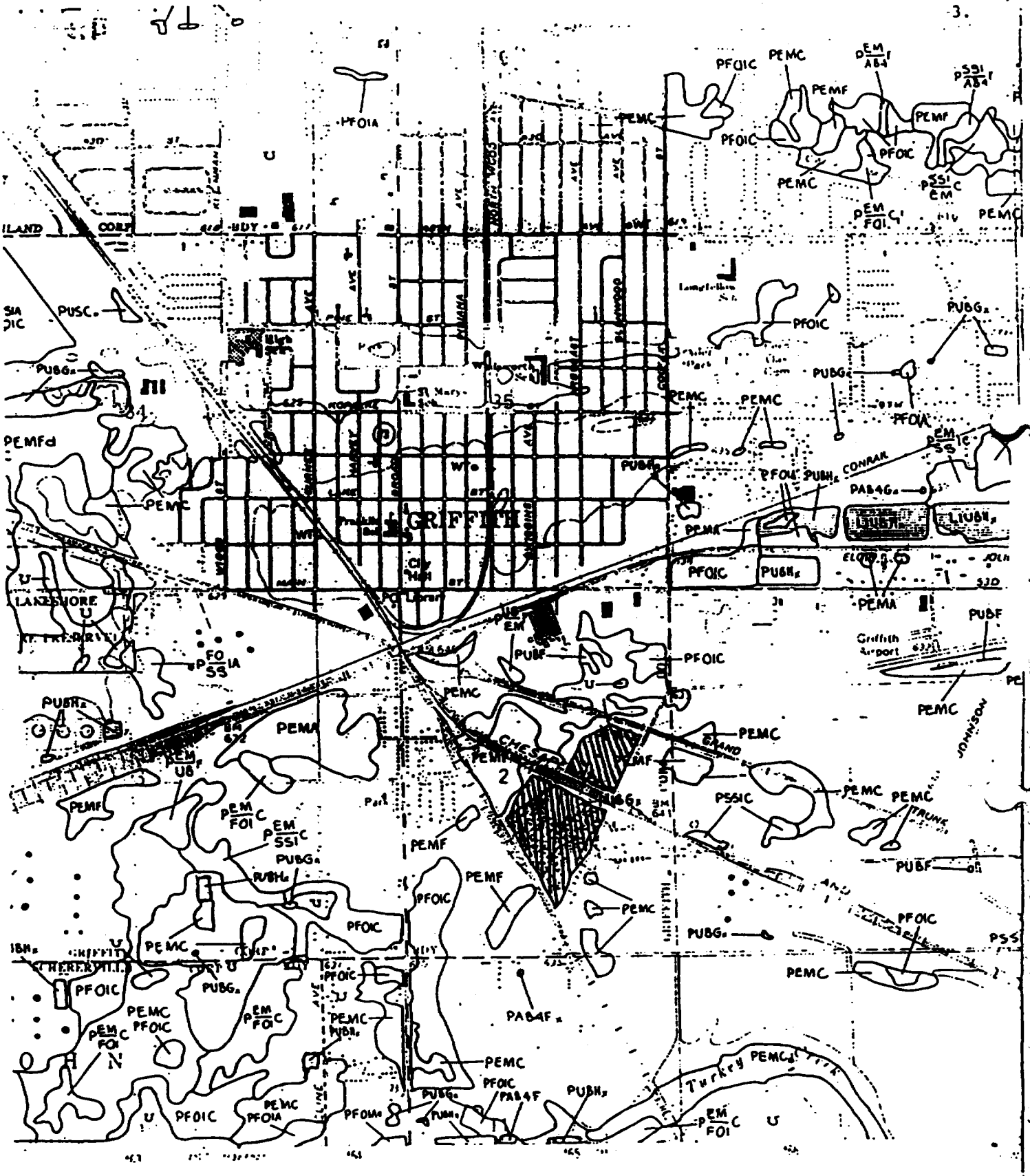


FIGURE 1. National Wetland Inventory map in the vicinity of the American Chemical Service site, Griffith, Indiana. USGS Highland Quadrangle. Cross-hatched area is ACS.

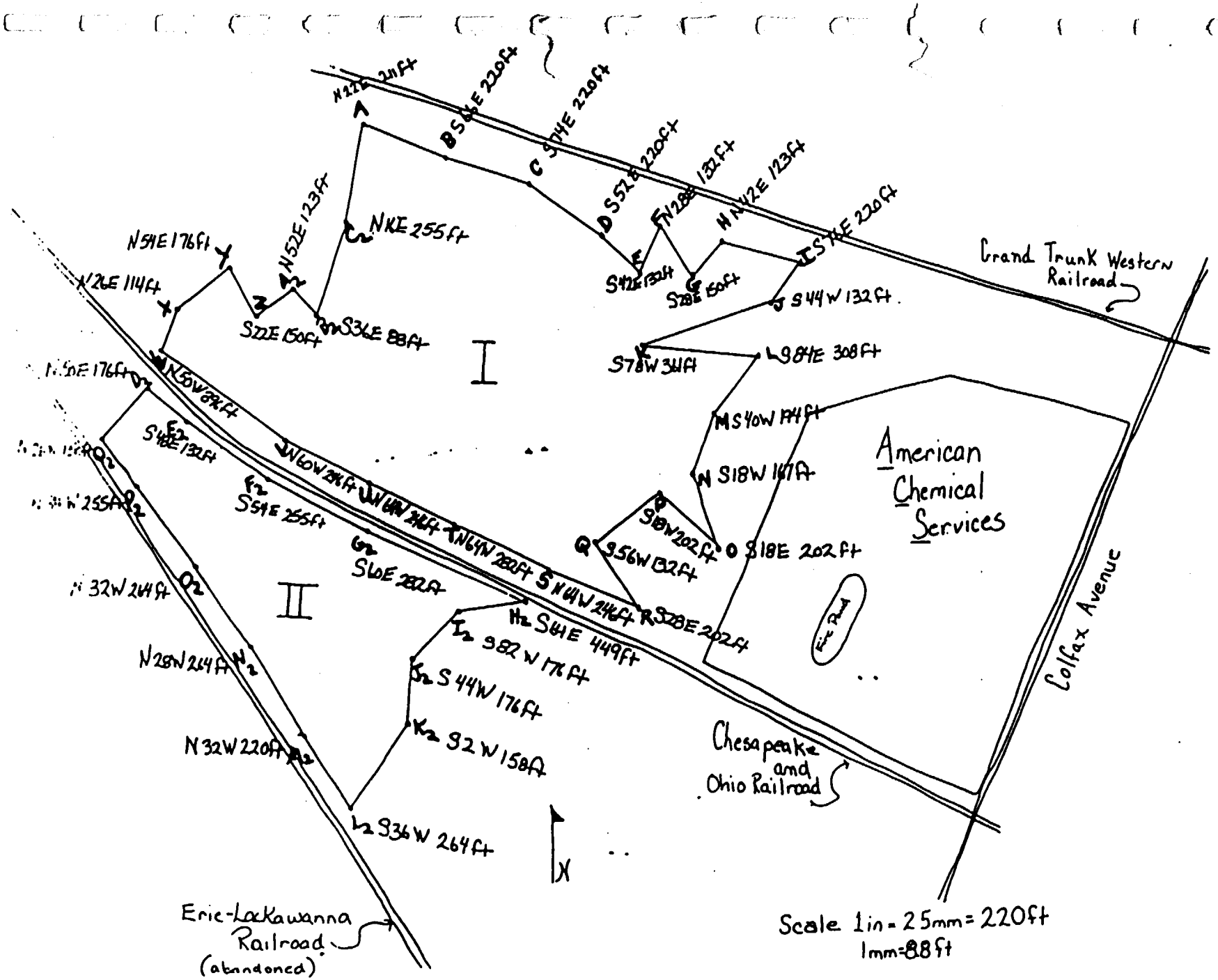
During the office review and map preparation a copy of the U.S. Soil Conservation Service Soil Survey for Lake County, Indiana (1972) was consulted to determine the presence or absence, and locations of hydric soils. The Lake County Indiana Survey sheet number 21 (Figure 2) indicates the majority of the area in question consists of Maumee loamy fine sand, interspersed with areas of Plainfield fine sand, Watseka loamy fine sand, and a small section of Tawas muck. The Maumee loamy fine sand and Tawas muck are classified by the U.S. Department of Agriculture and the Soil Conservation Service (1986) as hydric soils. The soil survey was used to compare soil types to the general configuration of the visual boundary of the wetlands on the aerial photograph. To avoid damaging the aerial photograph, a clear plastic overlay was attached and the information transcribed. Points along the visual perimeter of the wetland that coincided with the hydric soils boundaries were randomly selected and their compass bearings recorded to assist in field location. Location of the points were arbitrarily located from 88 to 282 feet apart based upon a scale of 1 inch (in) = 25 millimeters (mm) = 220 feet (ft), 1 mm = 8.8 ft. The preliminary map generated in the office (Figure 3) was used in the field reconnaissance flagging effort. In the field, point A was located on ground by its position relative to the railroad track embankment and the tree row in the upper northwest corner of the study area. Based upon the preliminary map, point B was located with the use of a Suunto MC-1 mirror compass and was measured off with a tape measure 220 feet S 66 E of point A. All other points were located and measured off in the same manner. Orange flags were placed at each point, and pink flags were placed every 55 feet to assist in maintaining the proper bearing alignment. During the flagging reconnaisance visit, no sign of disturbed conditions existed in the wetland areas with the exception of the railroad embankments that were placed through the wetlands, and minor disturbances such as small clearings for groundwater wells etc., resulting from other remedial investigation activities occuring at the site. An apparent illegal fill had occured in the wetland located adjacent to the Griffith City Landfill.

During the reconnaisance flagging visit it was noted that the entire wetland area identified on the National Wetland Inventory either possessed standing water (up to 2.5 feet in some areas; 5 feet in the ditches), or water-logged saturated soils (water table at soil surface). Based upon these field observations it was determined that the hydrologic criteria for wetlands was met.

To aid in the identification of the different soil types in the field, the soil profiles for Maumee loamy fine sand and Plainfield fine sand were recorded (Table 1). Because the soil sample probes were taken to a depth of 18 inches, only the first 3 incremented intervals were noted. Soil samples were collected at each point with a 21 inch Hoffer Soil Sampler probe. Due to extreme inclement weather, and the strikingly obvious difference between the hydric and non-hydric soils, the soil samples were observed in the field and the lowest 3 inches were collected in whirl-pak bags for later comparisons to the Munsell Soil Color charts. Areas possessing standing water did not yield soil samples due to wash-out upon extraction of the probe. In these instances the whirl-pak bag containing the point location tags were transported back to the office empty.

Representative observation areas (Figure 4) were selected based upon several factors. In addition to selecting areas that met the hydric soil criterion, representative observation areas that had apparent characteristics, but were not identified on the National Wetland Inventory map were also chosen. The plant communities were characterized, and the percent areal cover of the dominant species

FIGURE 2. U.S. Soil Conservation Survey-Lake County. Plate number 21. Cross-hatched area is AOS. Shaded areas are hydric soils.



3. Preliminary wetland boundaries transcribed from 1984 aerial photograph. (Reduced 64%)

Table 1. Typical, Profiles for Maumee loamy fine sand (Hydric) and Plainfield fine sand (Non-hydric) in Lake County, Indiana.

Maumee loamy fine sand			Plainfield fine sand		
Depth	Color	Munsell Notation	Depth	Color	Munsell Notation
0-9 inches	Black	N 2/0	0-4 inches	Dark Grey	10 YR. 3/1
9-16 inches	Black	N 2/0	4-6 inches	Greyish brown	10 YR. 4/2
16-21 inches	Black	N 2/0	6-27 inches	Yellowish brown	10 YR. 5/4

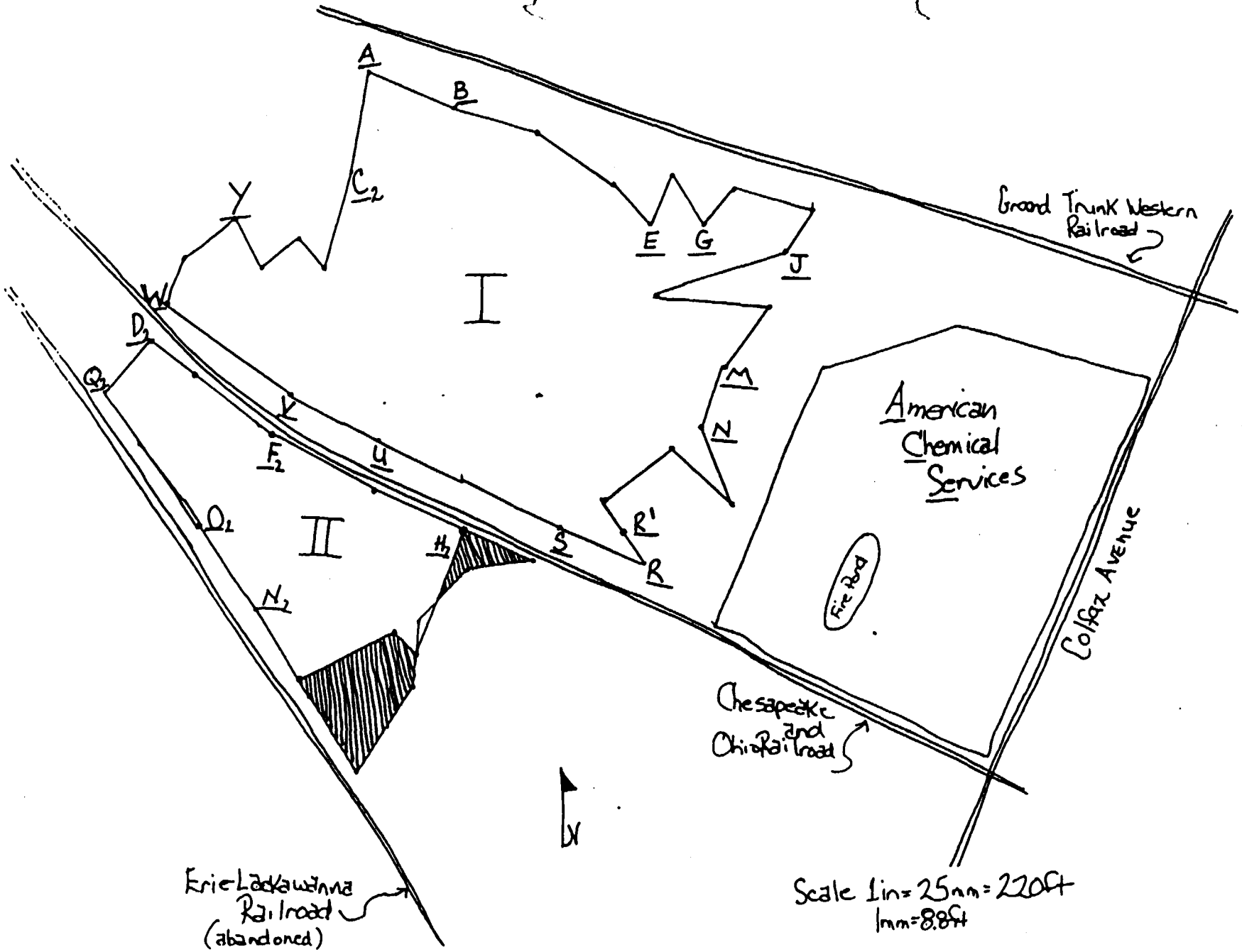


Fig. 1. Representative observation areas for vegetation sampling. Cross-hatched area lost to landfill expansion.

in the communities were visually estimated. Samples of the dominant vegetation at each of the representative areas were collected in 8 gallon plastic bags and transported to the office for later identification. A list of references used is included in Appendix 1. Once the vegetation was identified the information was recorded on field data forms and the indicator status of the species was obtained from the National List of Plant Species that occur in Wetlands; Indiana (1988). A wetland determination was then made for each representative observation area based upon the 3 mandatory technical criteria; hydrophytic vegetation, hydric soils, and wetland hydrology, as outlined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands. The information obtained in the survey was used to prepare the final map of the site wetlands. It is important to note that no "additional" wetlands have been delineated in terms of acreage. This study has examined wetlands currently shown on the National Wetland Inventory map, and differentiated between the existing habitat types that are not delineated on the NWI within the original boundaries. The wetland boundaries indicated on Figures 5 and 6 were drawn based upon visual field observations of shifts in dominant vegetation. All soils within the peripheral boundaries are hydric.

RESULTS AND DISCUSSION

Of the 21 representative observation areas sampled, 12 met all 3 mandatory technical criteria for wetland determination (Table 2). Of the 9 areas that failed the mandatory technical criteria test, M, N, S, D_2, and H_2 lacked all 3 criteria; C_2 and Q_2 lacked hydrophytic vegetation criteria; R^1 lacked hydric soil and hydrology criteria, and F_2 lacked wetland hydrology and hydrophytic vegetation criterion.

Wetland I

Wetland I is bounded by the Grand Trunk Western Railroad, the American Chemical Services site, and the Chesapeake and Ohio Railroad. Based upon the results of the survey this area is more complex than the National Wetland Inventory (NWI) indicates (Figure 5). NWI shows this area as consisting of a large palustrine, emergent, semi-permanent mixed with seasonally flooded wetland. The NWI does not show any of the forested or scrub-shrub wetlands bordering the palustrine emergent area. Of the 15 representative observation areas selected for Wetland I, the 5 that did not meet the technical criteria for wetland determination were all transitional zones between the wetland-upland interface. Non-hydric soils were present at 4 of the 5 areas. All of the areas possessed hydrophytic vegetation, but the percentage of FACU and UPL exceeded the percentage of FACW and OBL species at each of the 5 areas except R^1. It should be noted that some species were collected at the various areas that did not have indicator category designations; these species were not located in either the state or national list of plant species found in wetlands. It is sophistic to automatically list species not included on the National Plant List as UPL species, however, based upon reviewers suggestions this has been done with the exception of 2 species of liverworts: Riccia fluitans and Ricciocarpus natans. These two species are bryophytes which are found in the water; it would be completely erroneous to list these as UPL species.

Wetland II

Wetland II is bounded by the Chesapeake and Ohio Railroad, the City of Griffith landfill, and the abandoned Erie-Lackawanna Railroad bed. Wetland II, according to the NWI is a palustrine, emergent, semi-permanent wetland. The various other habitat types surrounding it have been omitted from the official map.

This wetland area has been impacted due to past and present expansion of the City of Griffith Landfill. Approximately 5 acres of emergent/scrub-shrub/forested wetland on the north and southeast corners have been filled since the 1984 aerial photograph was taken. There is also a gravel road/turn-around that appeared to have been recently laid in the center of the palustrine, emergent, seasonally flooded wetland (Figure 5). This was probably an illegal fill; the U.S. Army Corps of Engineers has been notified.

There were 4 representative observation areas that did not meet the 3 technical criteria for wetland designation. However, 3 areas were placed along the railroad embankment, due to the location of a drainage ditch (approximately 5 feet deep) lying between the railroad tracks and the wetland area to the south of the ditch. Additional representative areas were not selected to replace areas not meeting the 3 mandatory criteria, any additional points along the railroad embankment would yield

Table 2. Results of the technical criteria test for 21 representative observation areas at the ACS site, Griffith, Indiana.

Area	Soil Series	Hydrophytic Vegetat	Hydric Soil		Wetland Hydrology		Wetland Determination	
		% OBL, FACW	Yes	No	Yes	No	Yes	No
A	Maumee loamy fine sand	71.0	X		X		X	
B	Maumee loamy fine sand	100.0	X		X		X	
E	Maumee loamy fine sand	66.7	X		X		X	
G	Maumee loamy fine sand	88.0	X		X		X	
J	Maumee loamy fine sand	100.0	X		X		X	
M	Plainfield fine sand	25.0		X		X		X
N	Plainfield fine sand	20.0		X		X		X
R[1]	Plainfield fine sand	50.0		X		X		X
R	Maumee loamy fine sand	66.0	X		X		X	
S	Plainfield fine sand	45.0		X		X		X
U	Maumee loamy fine sand	100.0	X		X		X	
V	Maumee loamy fine sand	100.0	X		X		X	
W	Maumee loamy fine sand	75.0	X		X		X	
Y	Maumee loamy fine sand	60.0	X		X		X	
C_2	Maumee loamy fine sand	16.0	X		X			X
D_2	Plainfield fine sand	14.0		X		X		X
F_2	Maumee loamy fine sand	40.0	X			X		X
H_2	Plainfield fine sand	25.0		X		X		X
N_2	Maumee loamy fine sand	100.0	X		X		X	
O_2	Maumee loamy fine sand	100.0	X		X		X	
Q_2	Maumee loamy fine sand	25.0	X		X			X

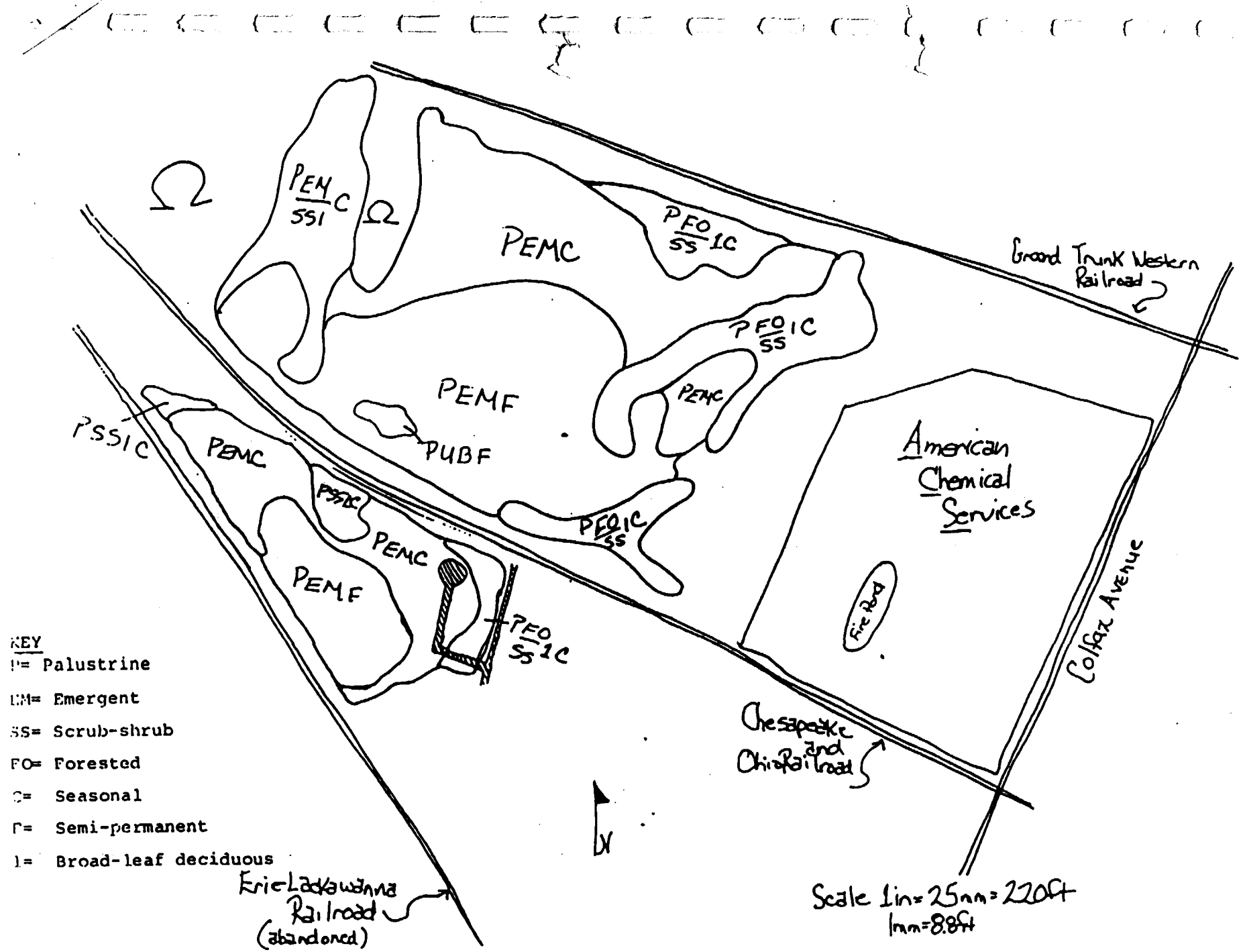


FIGURE 5. Wetland designations at the ACS site, Griffith, Indiana. Cross-hatched area is location of the illegal service road/turn-around fill.

the same results. Technically, the entire area would be classified wetlands if the railroad tracks and embankments did not exist. The 4th area lacked a predominance of hydrophytic vegetation.

NATURAL RESOURCES

This field investigation indicated that the natural resources and natural resource values of the wetland habitats are greater than originally suspected because of the diversity of habitat types present: emergent, scrub-shrub, and forested.

The vegetation of "marshes" is characterized by emergent aquatic plants growing in permanent to semi-permanent shallow water. Also present are species of shallow open water communities, as well as those found in sedge meadows and seasonally flooded basins. Marshes are among the most productive of all wetlands for waterbirds and furbearers, and can also provide spawning and nursery habitat for many species of fish. Birds that use marshes for breeding and feeding include ducks, geese, rails, herons, egrets, terns, and many songbirds. Raptors such as the osprey, bald eagle, and northern harrier frequent marshes in search of prey. Important furbearers inhabiting marshes include beaver, muskrat, and mink. Excellent winter habitat can be provided for upland wildlife, including ring-necked pheasant and eastern cottontail (Eggers and Reed 1987).

The emergent wetlands in the centers of wetland areas I and II are predominated by cattails. A list of species collected can be found in Table 3. Cattail stands provide important food and cover for wildlife. For example, the rhizomes are eaten by geese and muskrats. Muskrats also use the foliage to construct their lodges, which in turn can provide resting and nesting sites for waterbirds. Yellow-headed blackbirds, red-winged blackbirds, and marsh wrens build their nests in cattail vegetation. Wetland area I contains an open water area with a muskrat den and much activity in this area was apparent.

The transitional zones between the emergent areas and shrubby or forest areas support hydrophytic vegetation on saturated but not inundated soils. Plants occurring in these areas include species found in other communities, such as the annuals of seasonally flooded basins, emergent aquatics of marshes, and invading shrubs or trees, which are present as scattered, small individuals.

The transitional emergent zones are particularly important for their water quality functions. Wildlife habitat is provided for many species including sandhill crane, ring-necked pheasant, common snipe, sedge wren, small mammals, and white-tailed deer. The composites found in these areas are an important fall and winter food source for songbirds.

Scrub-shrub wetlands are plant communities dominated by woody vegetation less than 20 feet in height and with dbh's of less than 6 inches growing on saturated to seasonally flooded soils. They can be dominated by willows and/or red-osier, and sometimes silky (swamp) dogwood. These areas usually retain some of the forbs, grasses, and sedges of the transitional emergent zones. The vegetation in scrub-shrub wetlands possesses a variety of wildlife value. Willows are browsed by white-tail deer and eastern cottontails; red-osier dogwoods provide berries for song birds and ruffed grouse and are browsed by deer and rabbits; and elderberry also provides berries for songbirds and ruffed grouse.

Forested wetlands are dominated by mature conifers or lowland hardwood trees. They

Table 3. List of Vegetation Species collected on April 10-11, 1990 at the ACS site, Griffith, Indiana.

Scientific Name	Common Name	Indicator Category*
Agrimonia parviflora	Agrimony	FAC+
A. pubescens	Agrimony	**UPL**
Ampelopsis arborea	Peppervine	FACW
Apocyneum androsaemifolium	Spreading dogbane	**UPL**
Aronia arbutifolia	Red chokeberry	FACW
Betula allegheniensis	Yellow birch	FAC
tha palustris	Marsh marigold	OBL
tis occidentalis	Hackberry	FAC-
Cornus ammonum	Swamp dogwood	FACW+
C. stolonifera	Red-osier dogwood	FACW
Corylus americana	Hazelnut	FACU
Cytisus scoparius	Scotch broom	**UPL**
Dipsacus sylvestris	Teasel	FAC
Fragaria virginiana	Common Strawberry	FAC-
Galium aparine	Bedstraw	FACU
Hamamelis virgiana	Witch hazel	FACU
Liquidambar styraciflua	Sweet Gum	FACW
Ludwigia glandulosa	Ludwigia	OBL
Lyriodendron tulipifera	Tuliptree	FACU+
Nyssa sylvatica	Tupelo	FACW+
Onoclea sensibilis	Sensitive fern	FACW
Populus deltoides	Cottonwood	FAC+
P. grandidentata	Large-tooth Poplar	FACU
tremoides	Quaking Aspen	FAC
Prunus pennsylvanica	Pin cherry	FACU
Pteris esculenta	Braken fern	FACU
Quercus alba	White oak	FACU
Q. bicolor	Swamp white oak	FACW+
Q. coccinea	Scarlet oak	**UPL**
Q. palustris	Pin oak	FACW
Q. rubra	Northern red oak	FACU
Q. velutina	Black oak	**UPL**
Rhus copellina	Dwarf sumac	**UPL**
Riccia fluitans	Liverwort	NONE
Ricciocarpus natans	Liverwort	NONE
Rosa carolina	Wild rose	FACU-
R. multiflora	Multi-flora rose	FACU
R. nitida	Northeastern rose	**UPL**
Rubus allegheniensis	Highbush blackberry	FACU+
R. canadensis	Smooth blackberry	**UPL**
R. hispidus	Swamp dewberry	FACW
R. villosa	Low blackberry	**UPL**
Salix discolor	Pussy willow	FACW
S. exigua	Sandbar willow	OBL

Table 3. List of Vegetation Species (Con't).

Scientific Name	Common Name	Indicator Category
Sambucus canadensis	Elderberry	FACW-
Solidago altissima	Golden rod	FACU
Sonchus arvensis	Field sow-thistle	FAC-
Spiraea alba	Meadow sweet	FACW+
S. latifolia	Meadow sweet	FACW-
Stenanthium gramineum	Featherbells	FAC
Thelypteris thelypteroides	Marsh fern	FACW
Typha angustifolia	Narrow-leaf cattail	OBL
T. latifolia	Broad-leaf cattail	OBL
Ulmus rubra	Slippery elm	FAC
Verbascum thaspus	Wooly mullein	**UPL**
Verbena urticifolia	White vervain	FAC+
Viburnum prunifolium	Black haw	FACU
Vitis aestivalis	Summer grape	FACU
V. vulpina	Frost grape	FACW-
Xanthorhiza simplissima	Yellowroot	**UPL**

*Species with bold **UPL** indicator status are not listed in the state or national plant lists and have been assigned this status by default.

are important for stormwater and flood retention, and also provide habitat for white-tailed deer, furbearers, songbirds, ruffed grouse, barred owl, and amphibians. The various wetland habitats at the American Chemical Services site are being used by a variety of wildlife species, many of which were observed during the reconnaissance flagging visit, and the field survey visit (Table 4).

ADDITIONAL WETLANDS

At a meeting held by the U.S. EPA project manager on February 28, 1990, FWS was requested to observe the area immediately east of American Chemical Services, adjacent to Colfax Road to determine if wetlands were present. This area was walked during the field reconnaissance flagging visit, which revealed various wetlands, some of which were not indicated on the NWI maps (Figure 6). There is a palustrine, emergent, semi-permanent wetland approximately 7 acres in size about 0.1 mile east of Colfax Road, that is identified on the NWI map. The field check revealed that this wetland extends west and southward within 20-30 feet of the roadway. These wetlands would be classified as a combination palustrine, emergent/scrub-shrub forested area with water regimes ranging between temporary, saturated, seasonal, seasonal saturated, and semi-permanent.

A wetland delineation was not conducted for this area, however, the soil survey maps indicate that portions do contain hydric soils.

ENDANGERED SPECIES

The Highland area of Lake County is represented by many federal and state species of special emphasis/concern, in addition to several federal threatened and endangered species. An annotated list follows:

Fed E	Indiana bat	Myotis sodalis
Fed E	Peregrine falcon	(Falco peregrinus) *Migratory
Fed T	Pitchers thistle	(Cirsium pitcheri)
Sp EM/CN	Great blue heron	(Ardea herodias)
	American bittern	(Botaurus lentiginosus)
	Black tern	(Chlidonis niger)
	Least bittern	(Ixobrychus exilis)
	King rail	(Ralus elegans)
	Yellow-crowned night heron	(Nycticorax violaceous)
	Spotted turtle	(Clemmys guttata)
	Western smooth green snake	(Opheodrys vernalis)
	Franklin's ground squirrel	(Spermophilus franklini)
	Blanding's turtle	(Emydoidea blandingi)
	Bald eagle	(Haliaeetus leucocephalus) *Historical

This endangered species list constitutes informal consultation only, and is not intended to fulfill the requirement of Section 7 of the Endangered Species Act of 1973, as amended. If, after review of the Phase I Remedial Investigation report, it appears likely that any endangered species may have been/may be affected by this site, it may be necessary to initiate formal consultation. If as a result of further consultation, a "no effect" determination is made regarding endangered species, that determination should be revisited after 1 year for new information or newly listed species.

Table 4. List of wildlife species observed utilizing the wetland habitats at the American Chemical Services site, Griffith, Indiana April 10-11, 1990.

Scientific Name	Common Name
BIRDS	
Agelaius phoeniceus	Red-winged blackbirds (many)
Aix sponsa	Wood ducks (1 pair)
Anas platyrhynchos	Mallard ducks (2 pairs)
Branta canadensis	Canada geese (1 pair)
Charadrius vociferus	Killdeer (1)
Corvus brachyrhynchos	Common crows (many)
Dendrocopos pubescens	Downy woodpeckers (2)
D. villosa	Hairy woodpeckers (1)
Larus spp.	Gulls (many)
Phasianus colchicus	Ring-necked pheasant (1 male)
Regulus satrapa	Golden-crown kinglets (2)
Richmondena cardinalis	Cardinals (3)
Spinus tristis	American goldfinches (1 pair)
MAMMALS	
Procyon lotor	Raccoon (tracks)
Odocoileus virginianus	White-tailed deer (tracks)
Ondatra zibethicus	Muskrats (3) & den
Sylvilagus floridanus	Eastern cottontails (4)

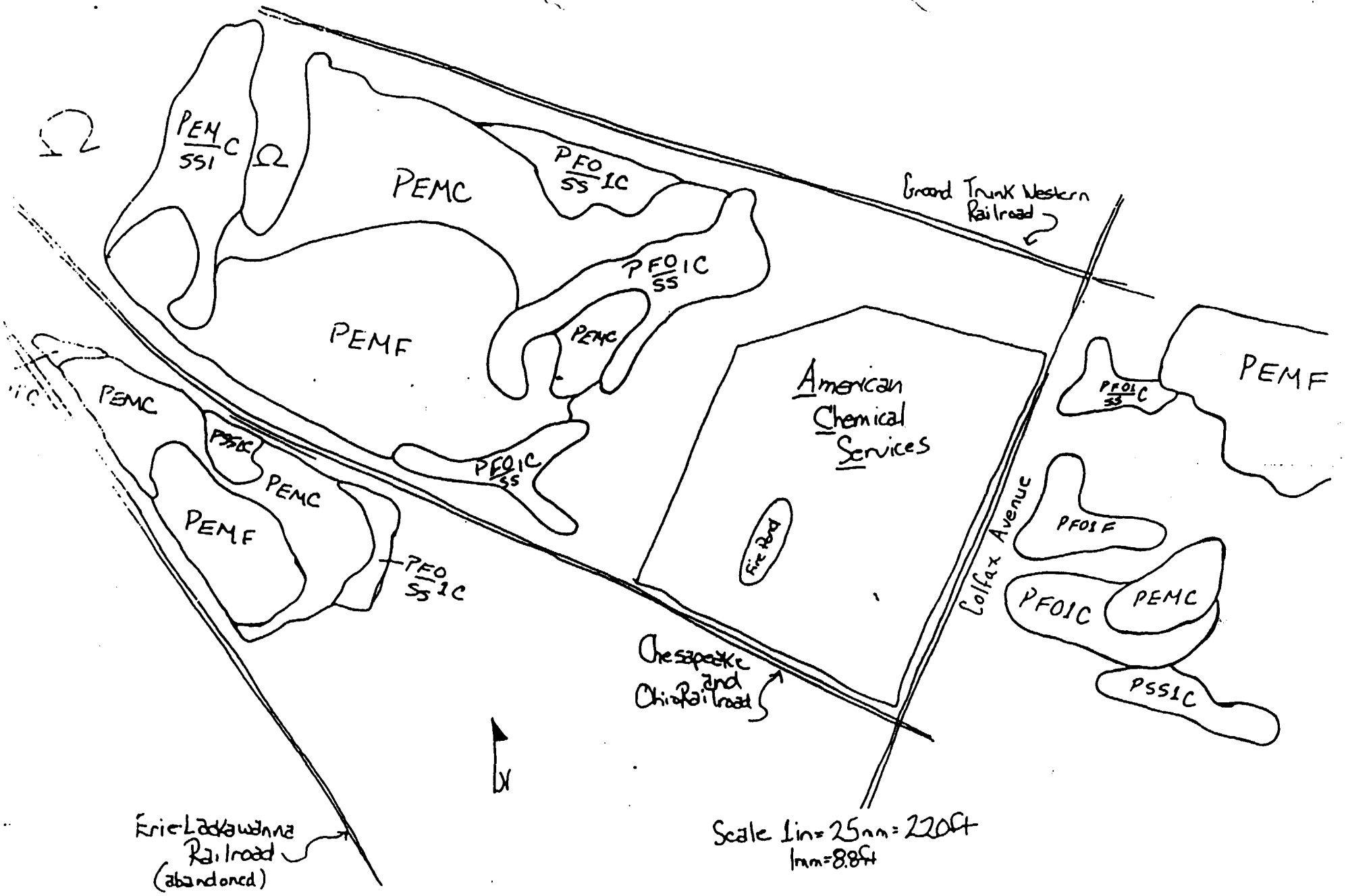


FIGURE 6. Approximate locations and classifications of additional wetlands located near the ACS site, east across Colfax Avenue, Griffith, Indiana.

CONCLUSIONS

1. Wetlands identified on the NWI do exist at the American Chemical Services site.

2. There are wetlands present at the site that are not identified on the NWI. These wetlands consist of palustrine, forested, and scrub-shrub transitional zones between the NWI-identified emergent wetland and upland areas.

3. The wetlands present at the site provide habitat diversity for a variety of wildlife species.

4. The wetlands present on the site possess potential habitat for federal threatened and endangered species, state and federal species of special concern/emphasis, and other birds protected by the Migratory Bird Treaty Act.

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APPENDIX 1

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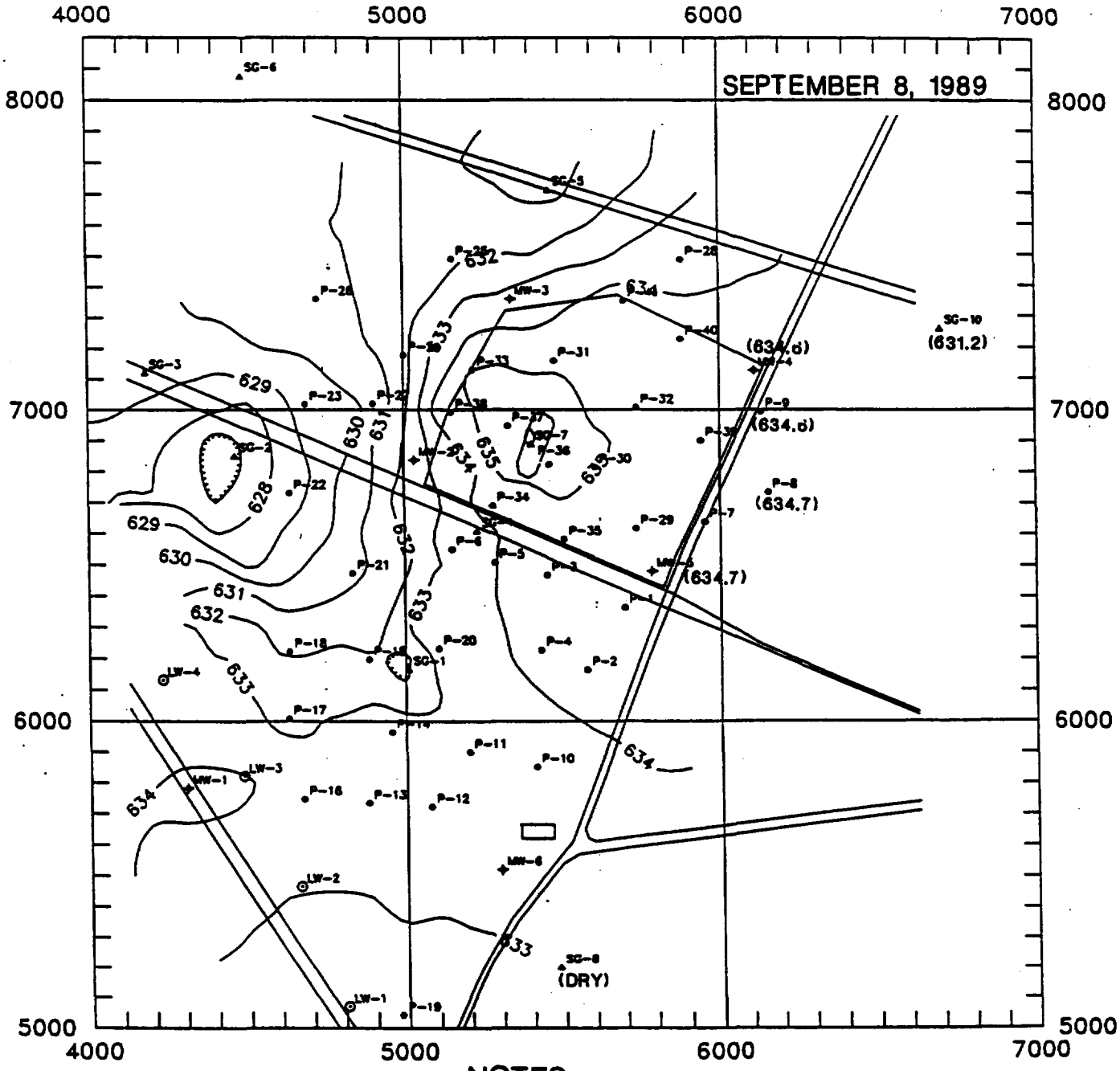
APPENDIX O

Groundwater Elevation Maps



NOTES

1. THE GROUNDWATER ELEVATION AT P-18 WAS NOT USED IN MAP CONSTRUCTION. THE ELEVATION AT THIS PIEZOMETER WAS APPROXIMATELY 10 FT. HIGHER THAN ADJACENT GROUNDWATER ELEVATIONS.

LEGEND

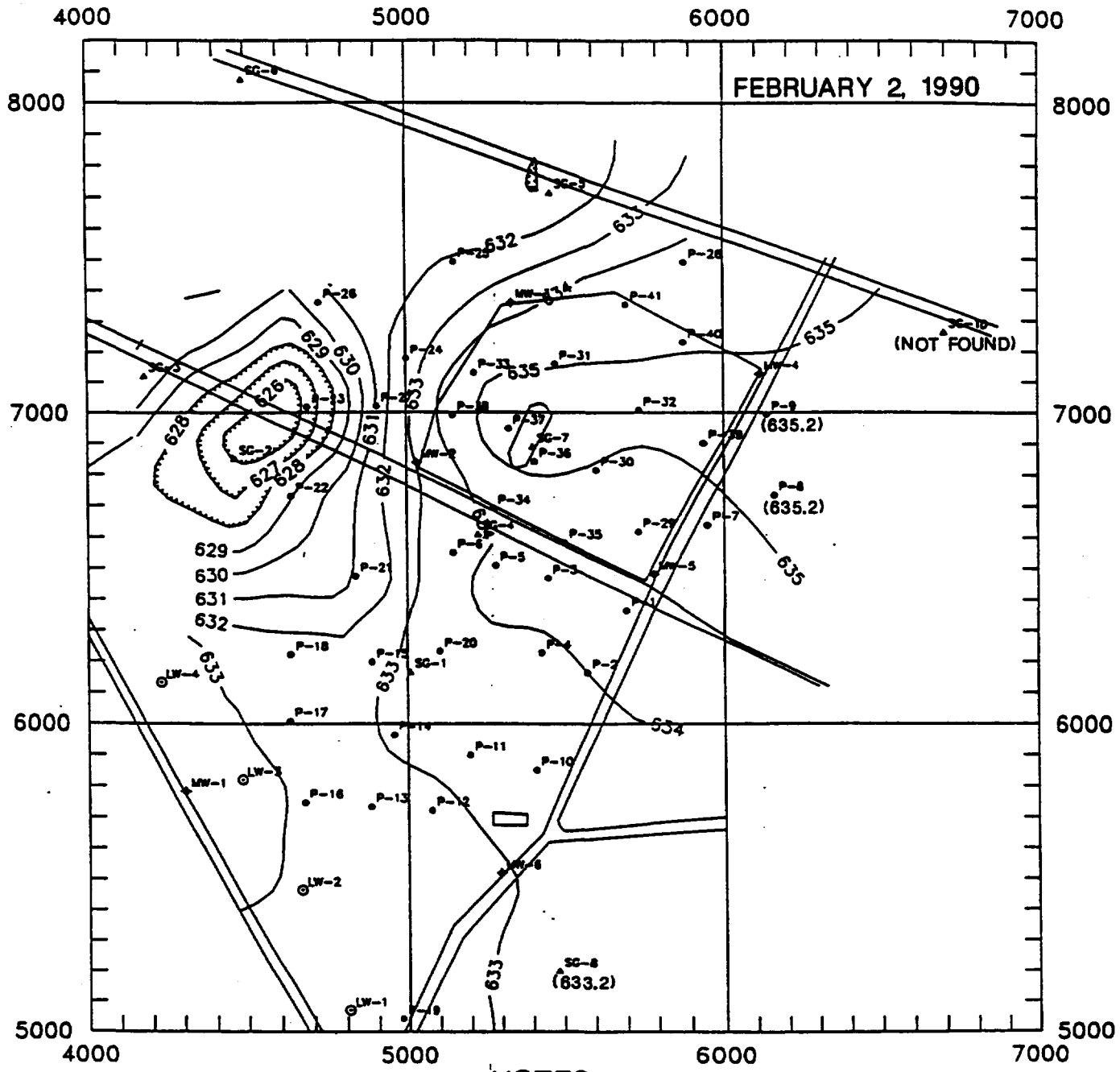
- UPPER AQUIFER MONITORING WELL LOCATION
- LOWER AQUIFER MONITORING WELL LOCATION
- LEACHATE WELL LOCATION
- PIEZOMETER LOCATION
- STAFF GAUGE LOCATION
- —620— WATER LEVEL CONTOUR LINE

north

0 500 1000

SCALE IN FEET

WARZYN	WATER TABLE CONTOUR MAP SEPTEMBER 8, 1989	Drawn D.L., T.J.M., J.A.W. Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions	Date
			60251



NOTES

1. A GROUNDWATER ELEVATION FOR MW-1 WAS NOT AVAILABLE. THIS WELL WAS DESTROYED PRIOR TO WATER LEVEL MEASUREMENT.
2. THE GROUNDWATER ELEVATION AT P-18 WAS NOT USED IN MAP CONSTRUCTION. THE ELEVATION AT THIS PIEZOMETER WAS APPROXIMATELY 10 FT. HIGHER THAN ADJACENT GROUNDWATER ELEVATIONS.

LEGEND

- UPPER AQUIFER MONITORING WELL LOCATION
- LOWER AQUIFER MONITORING WELL LOCATION
- LEACHATE WELL LOCATION
- PIEZOMETER LOCATION
- STAFF GAUGE LOCATION
- —620— WATER LEVEL CONTOUR LINE

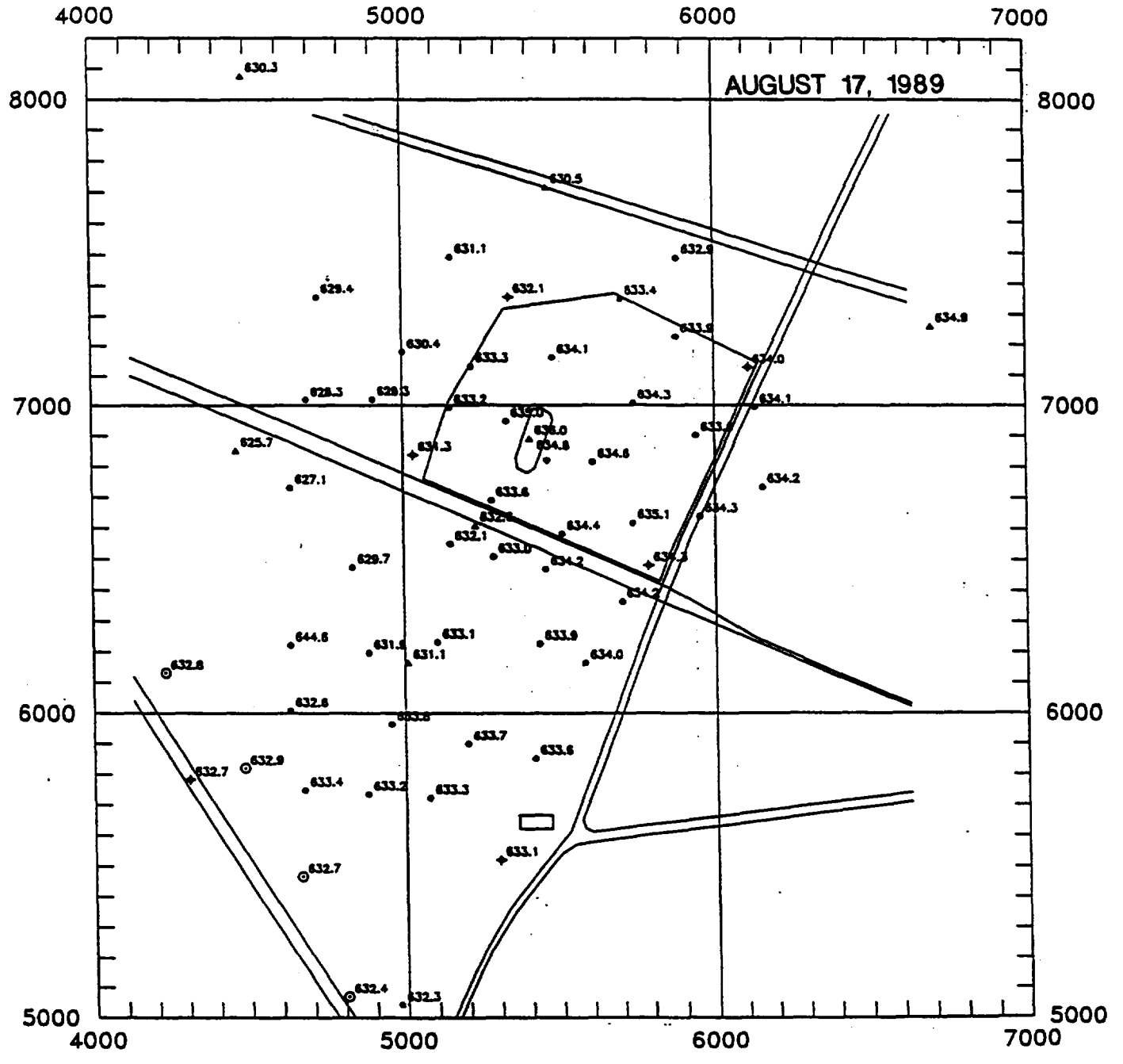
0 500 1000
SCALE IN FEET

north

WARZYN

WATER TABLE CONTOUR MAP
FEBRUARY 2, 1990
REMEDIAL INVESTIGATION
AMERICAN CHEMICAL SERVICES
NPL SITE
GRIFFITH, INDIANA

Drawn D.L.L., T.J.M., J.A.W. Checked App'd.
Revisions Date
60251



LEGEND

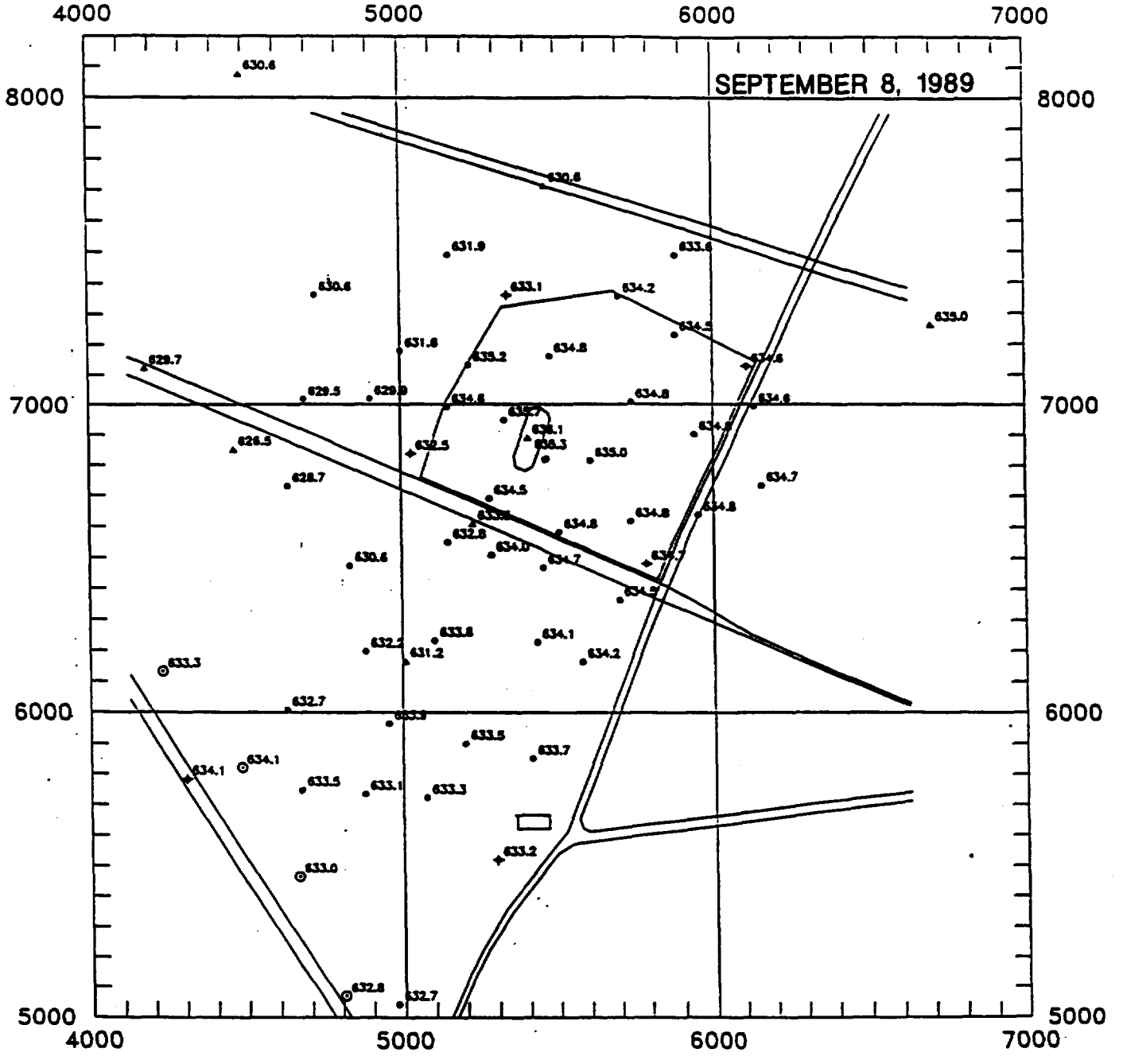
- ◆ UPPER AQUIFER MONITORING WELL LOCATION
- ◇ LOWER AQUIFER MONITORING WELL LOCATION
- ⊙ LEACHATE WELL LOCATION
- ● PIEZOMETER LOCATION
- ▲ STAFF GAUGE LOCATION

north

0 500 1000

SCALE IN FEET

WARZYN	MEASURED WATER LEVELS AUGUST 17, 1989	Drawn D.L.L., T.J.M., J.A.W. Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions	Date
			60251



LEGEND

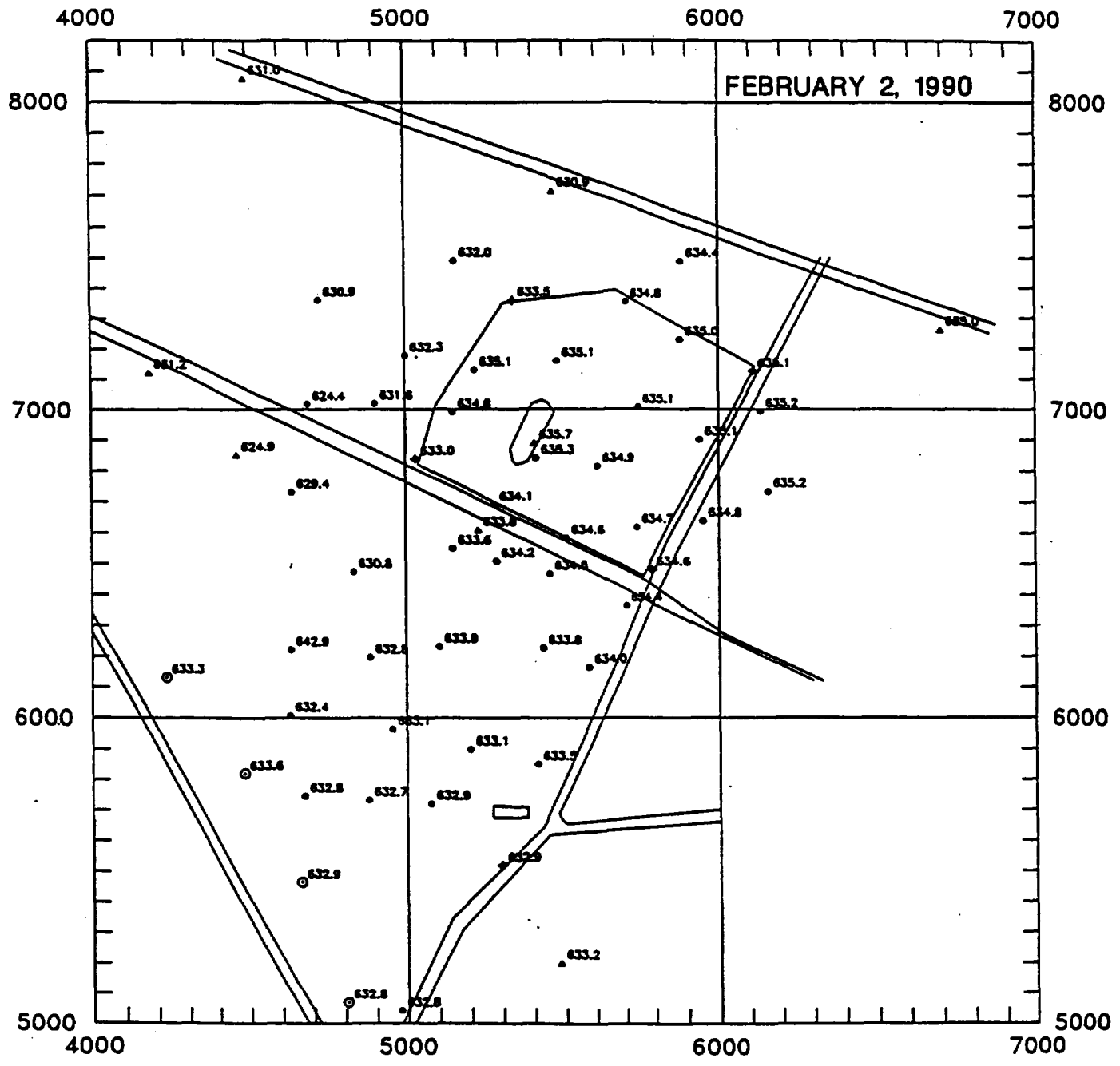
- UPPER AQUIFER MONITORING WELL LOCATION
- LOWER AQUIFER MONITORING WELL LOCATION
- LEACHATE WELL LOCATION
- PIEZOMETER LOCATION
- STAFF GAUGE LOCATION

north

0 500 1000

SCALE IN FEET

WARZYN	MEASURED WATER LEVELS SEPTEMBER 8, 1989	Drawn D.L.L., T.J.M., J.A.W. Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions	Date 60251



LEGEND

- ◆ UPPER AQUIFER MONITORING WELL LOCATION
- ◇ LOWER AQUIFER MONITORING WELL LOCATION
- ⊙ LEACHATE WELL LOCATION
- ● PIEZOMETER LOCATION
- ▲ STAFF GAUGE LOCATION

north

0 500 1000

SCALE IN FEET

WARZYN

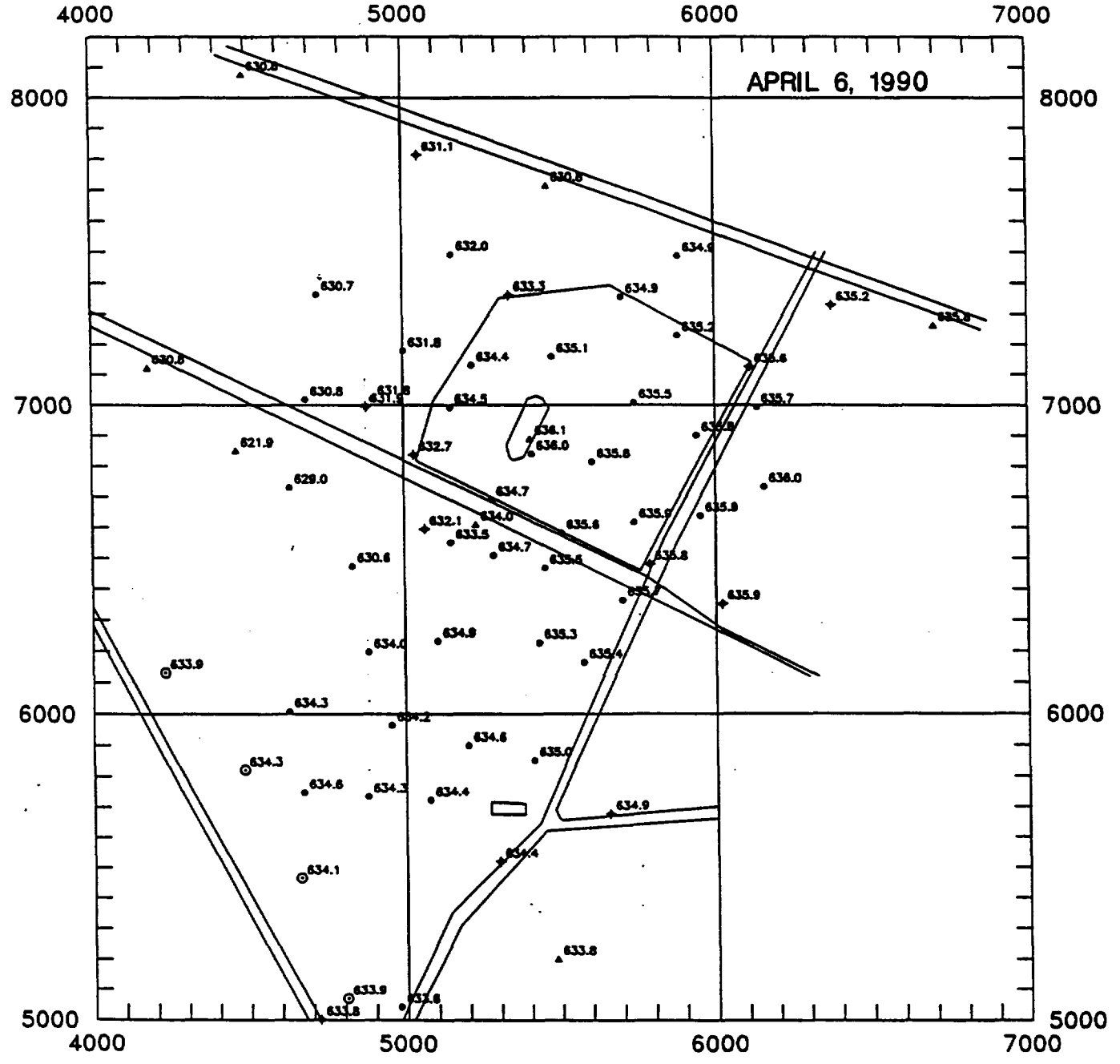
MEASURED WATER LEVELS
FEBRUARY 2, 1990

REMEDIAL INVESTIGATION
AMERICAN CHEMICAL SERVICES
NPL SITE
GRIFFITH, INDIANA

Drawn D.L.L., T.J.M., J.A.W. | Checked | App'd.

Revisions | Date

60251



LEGEND

- UPPER AQUIFER MONITORING WELL LOCATION
- LOWER AQUIFER MONITORING WELL LOCATION
- LEACHATE WELL LOCATION
- PIEZOMETER LOCATION
- STAFF GAUGE LOCATION

north

0 500 1000

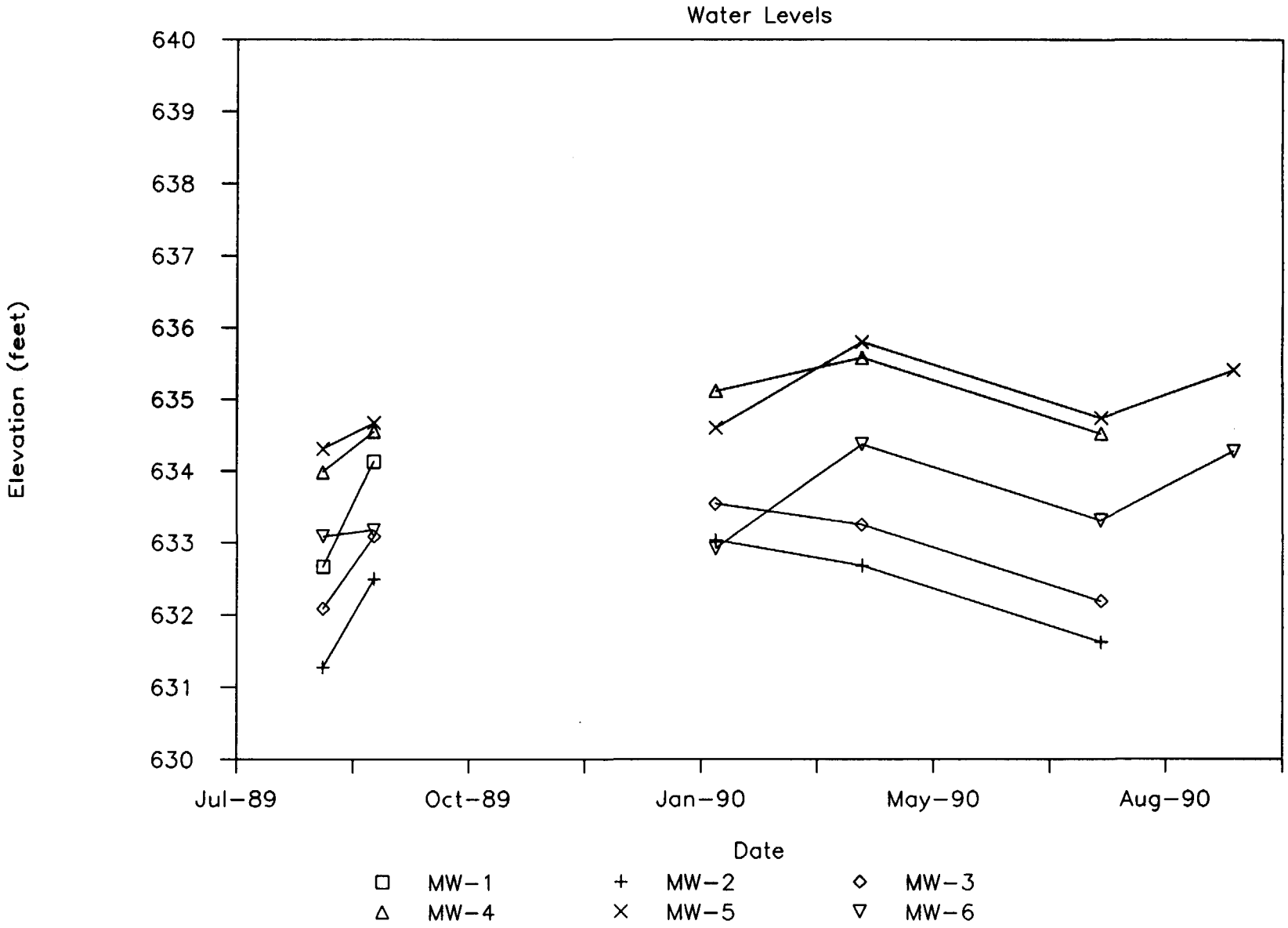
SCALE IN FEET

WARZYN	MEASURED WATER LEVELS APRIL 6, 1990	Drawn D.L.L., T.J.M., J.A.W. Checked	App'd.
	REMEDIAL INVESTIGATION AMERICAN CHEMICAL SERVICES NPL SITE GRIFFITH, INDIANA	Revisions	Date
			60251

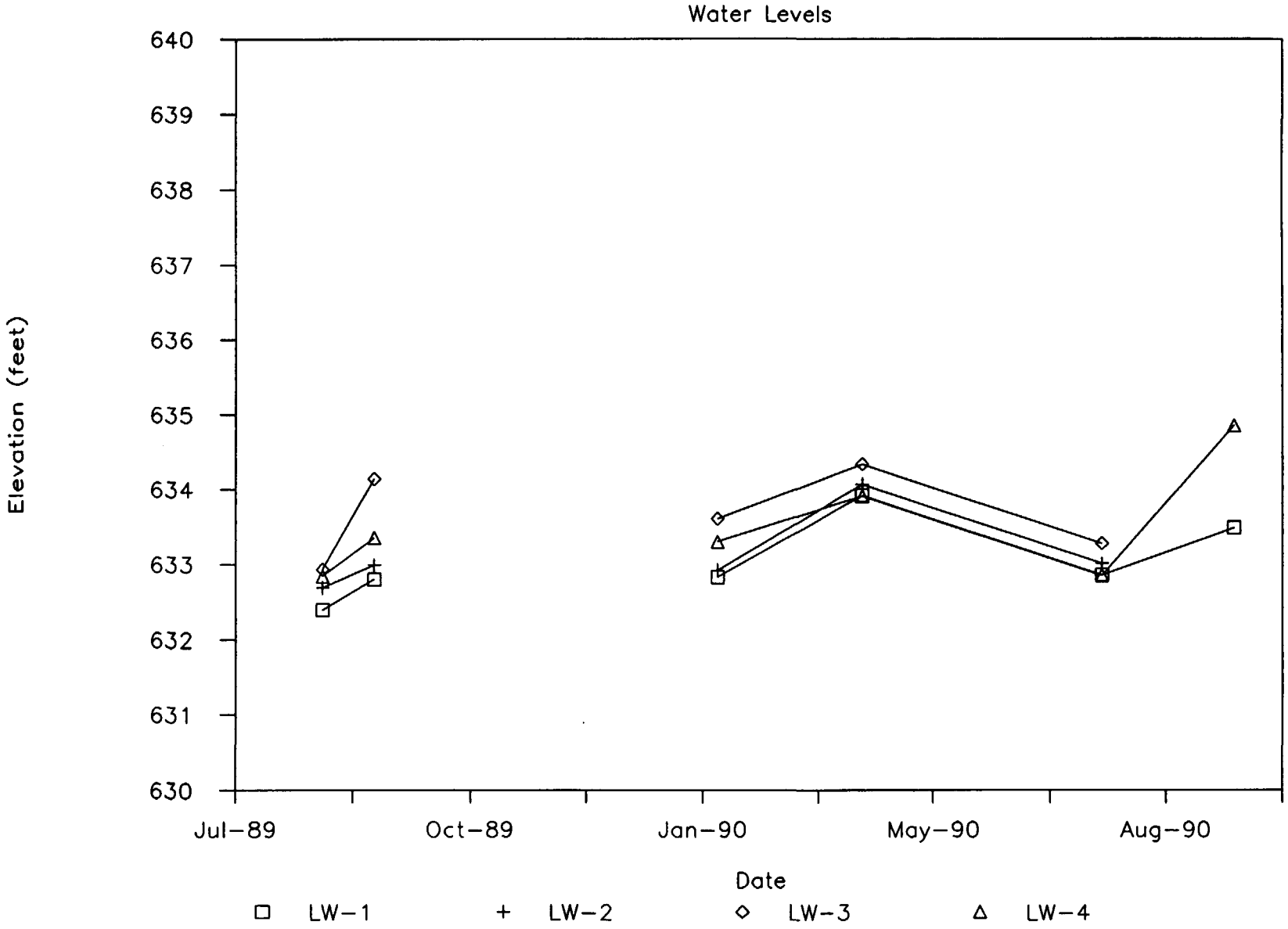
APPENDIX P

Groundwater/Surface Water Hydrographs

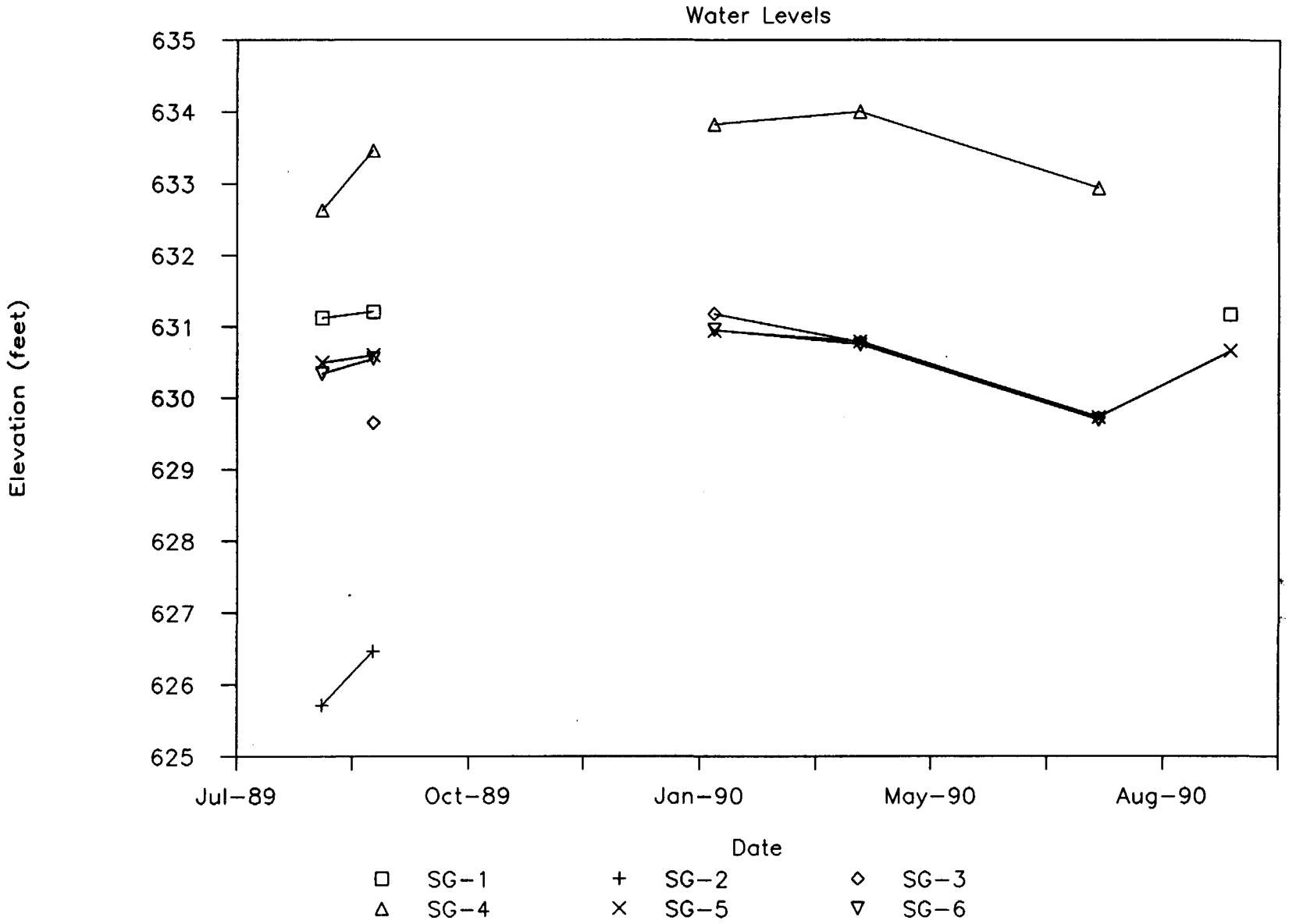
MW-1 through MW-6



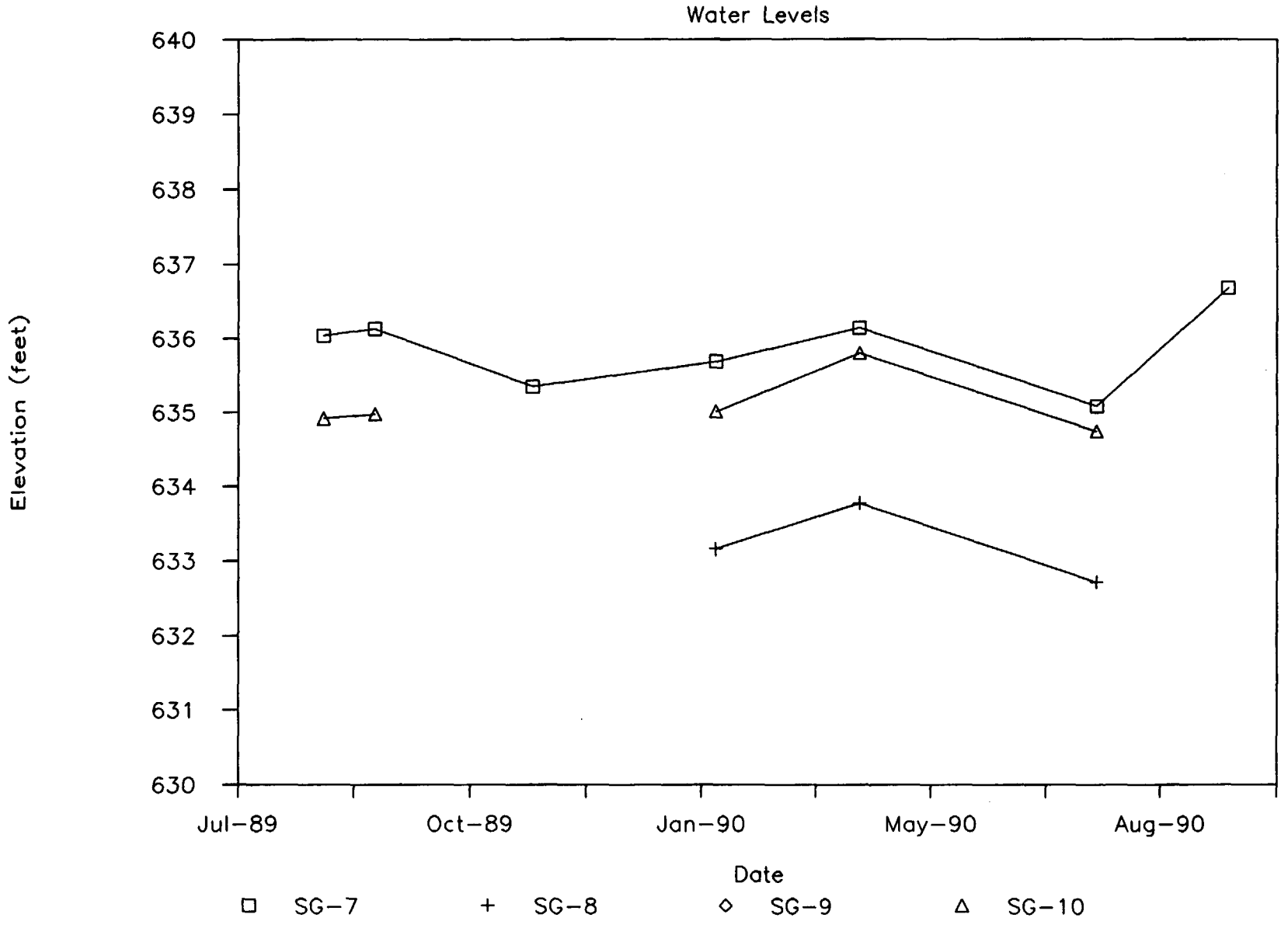
LW-1 through LW-4



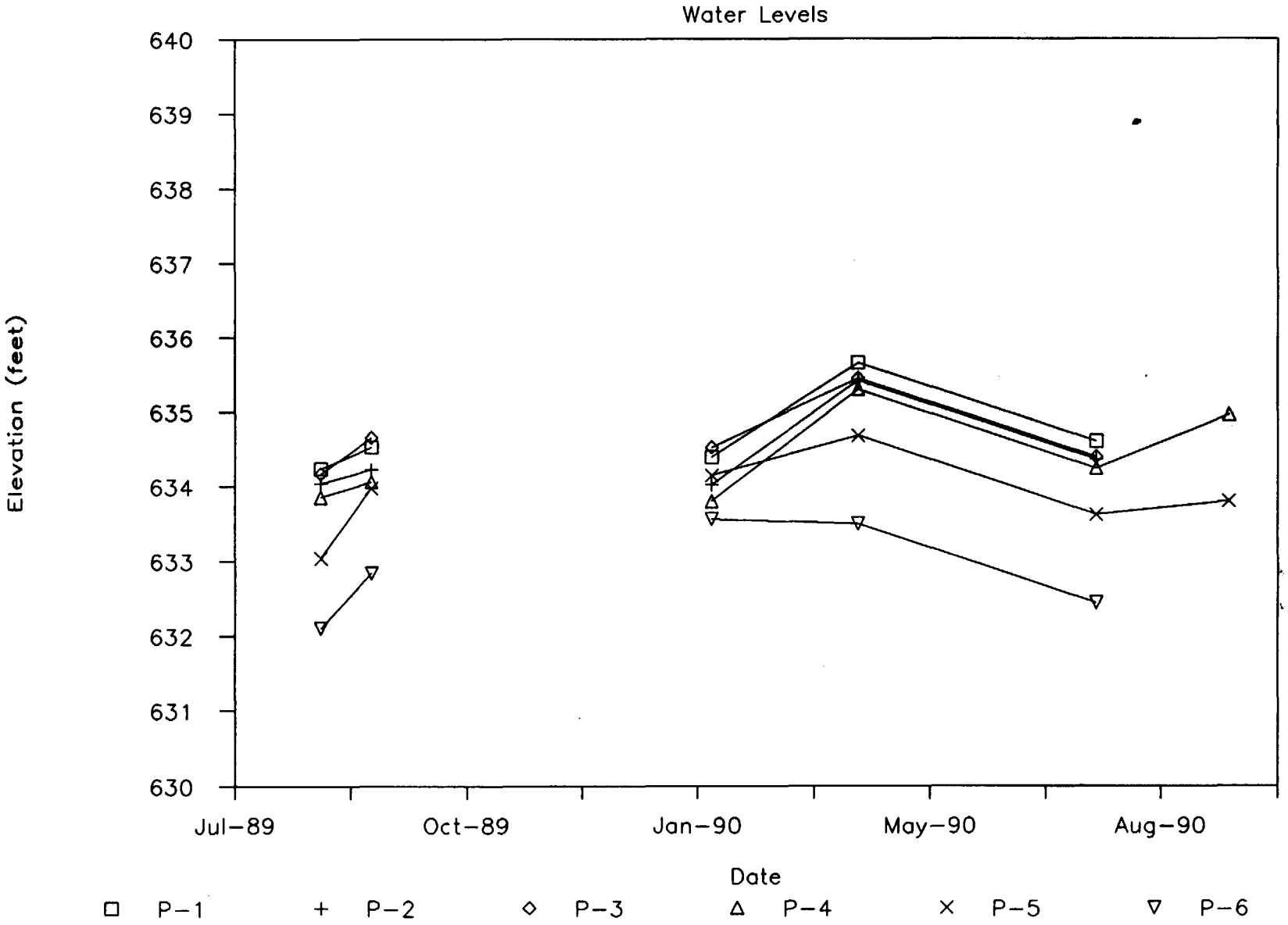
SG-1 through SG-6



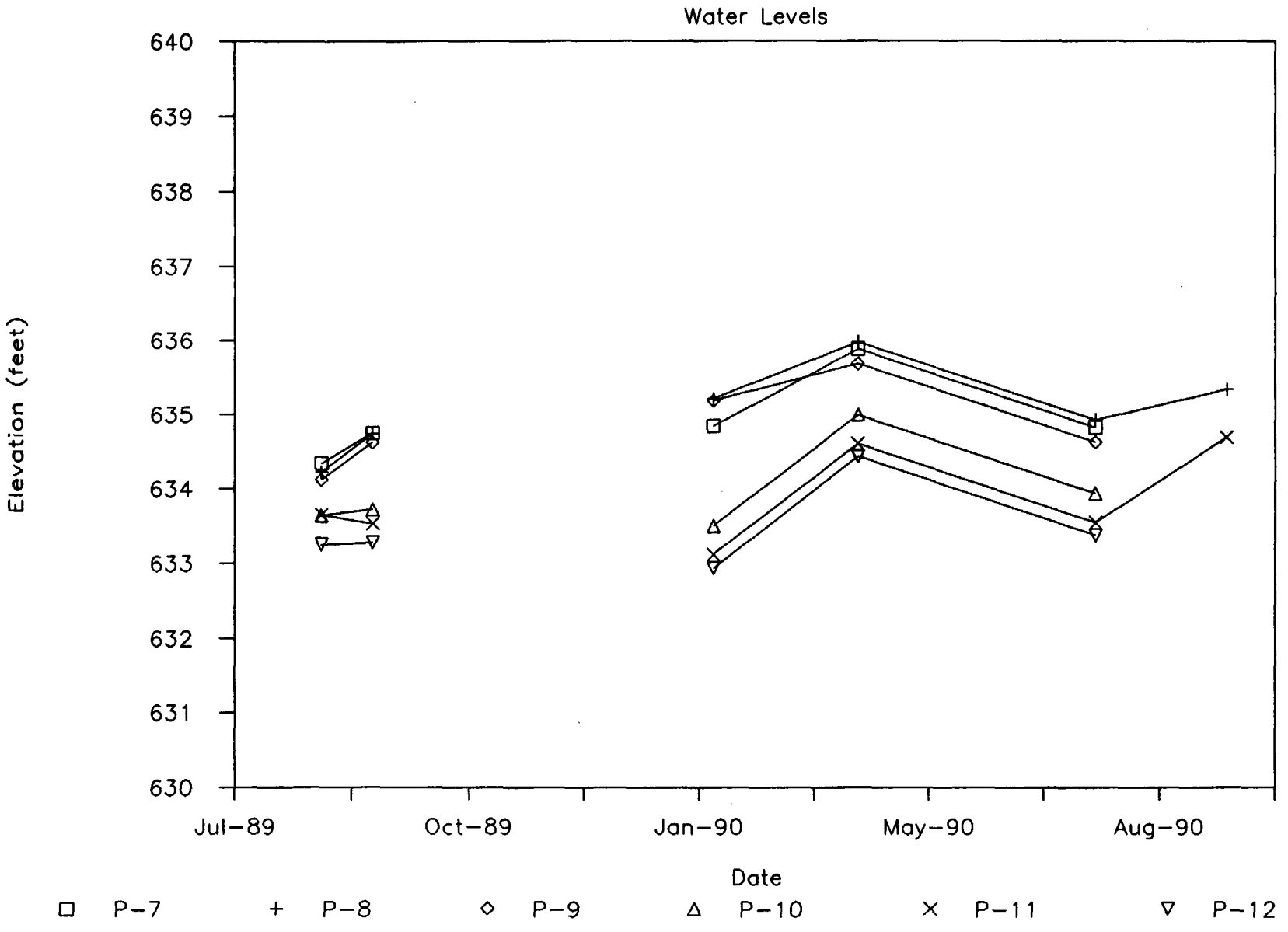
SG-7 through SG-10



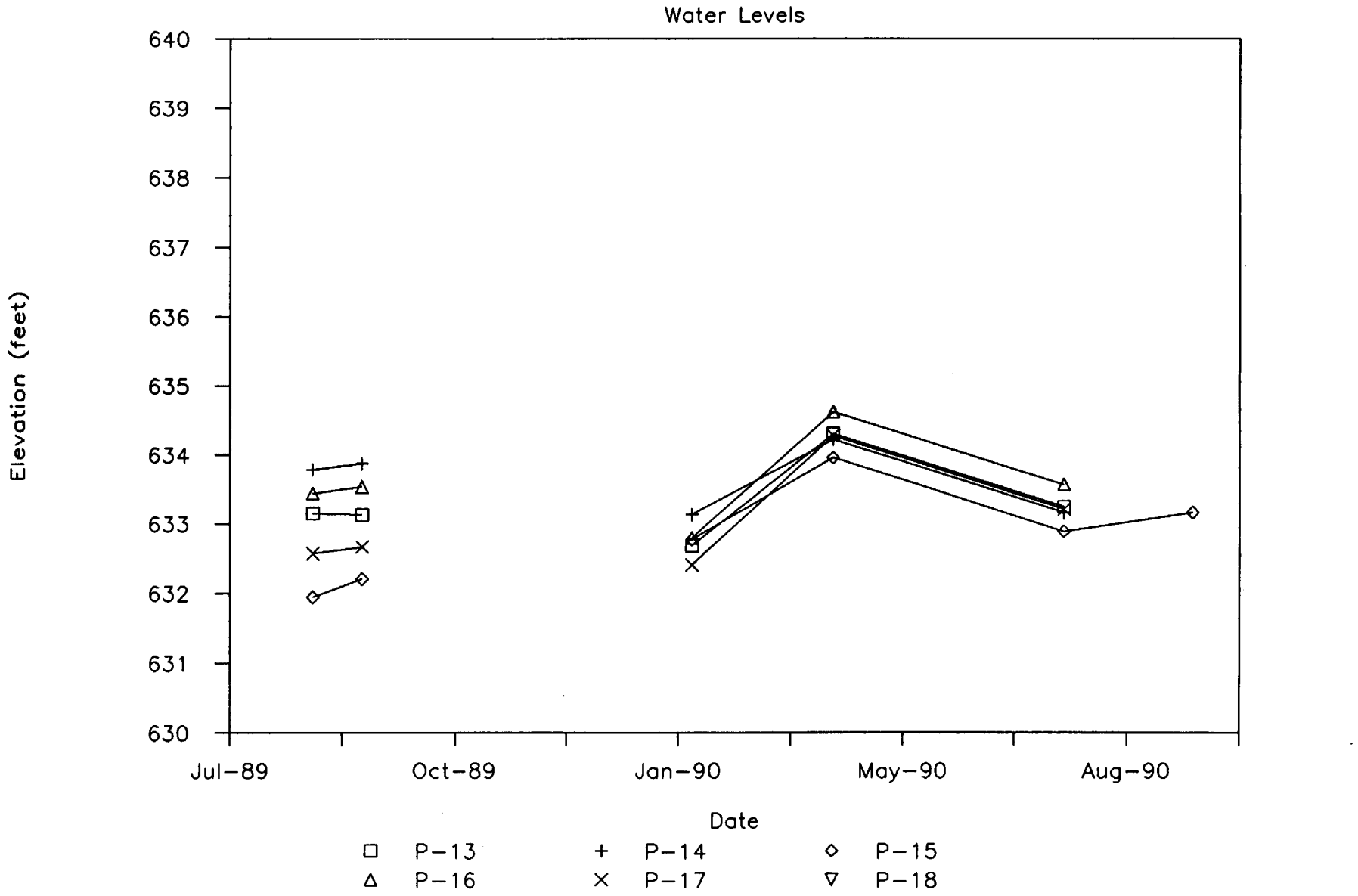
P-1 through P6



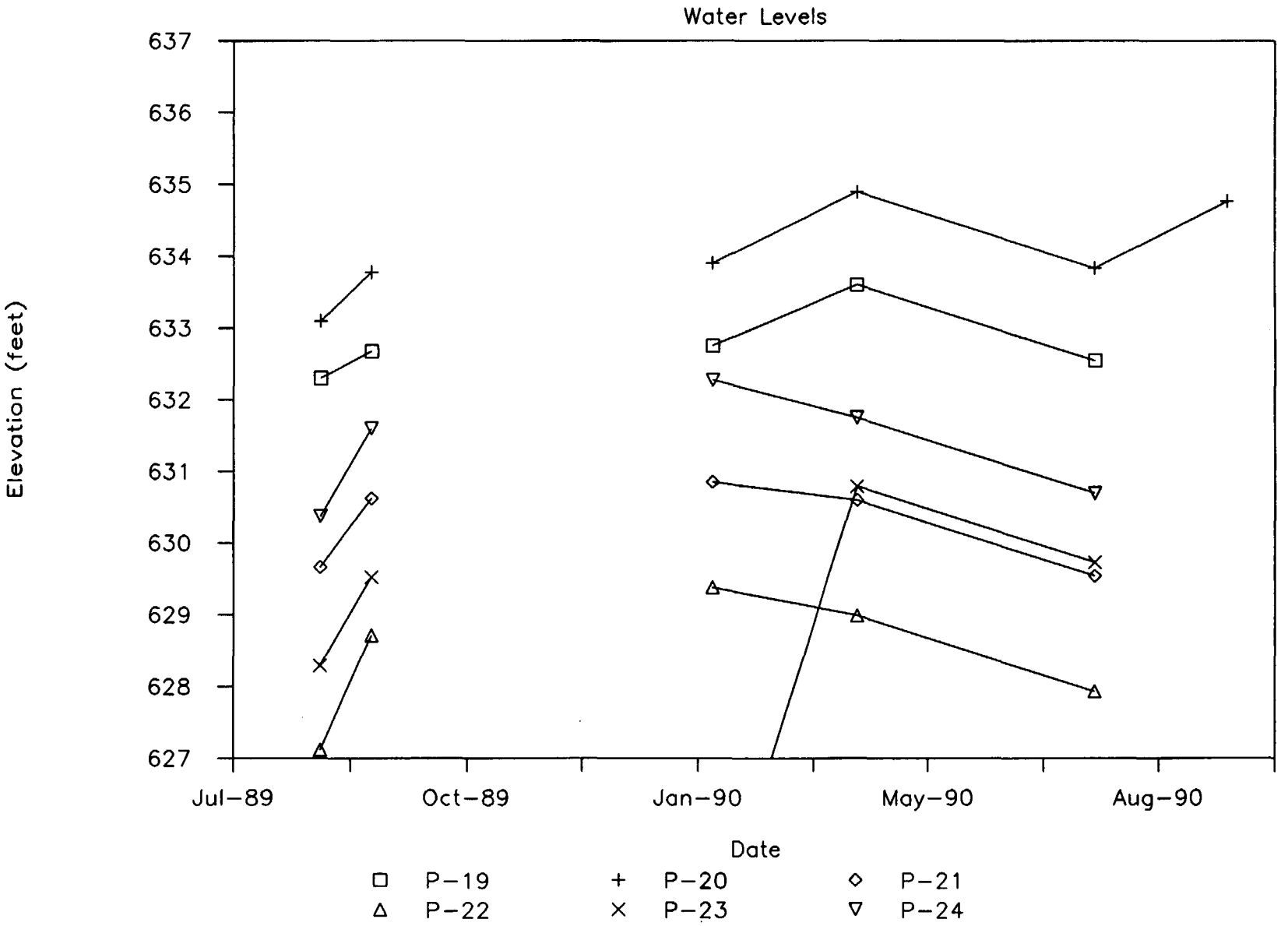
P-7 through P12



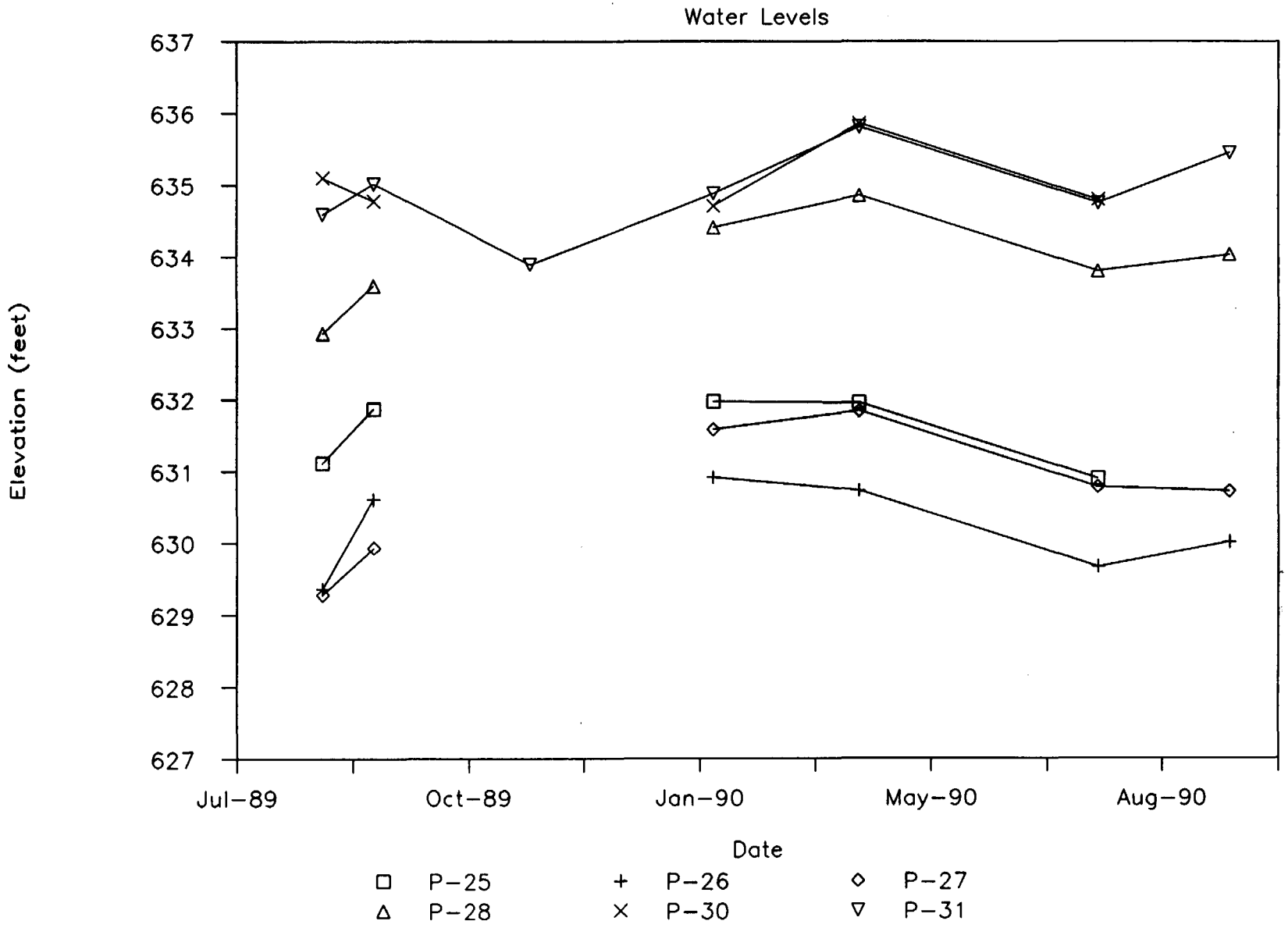
P-13 through P-18



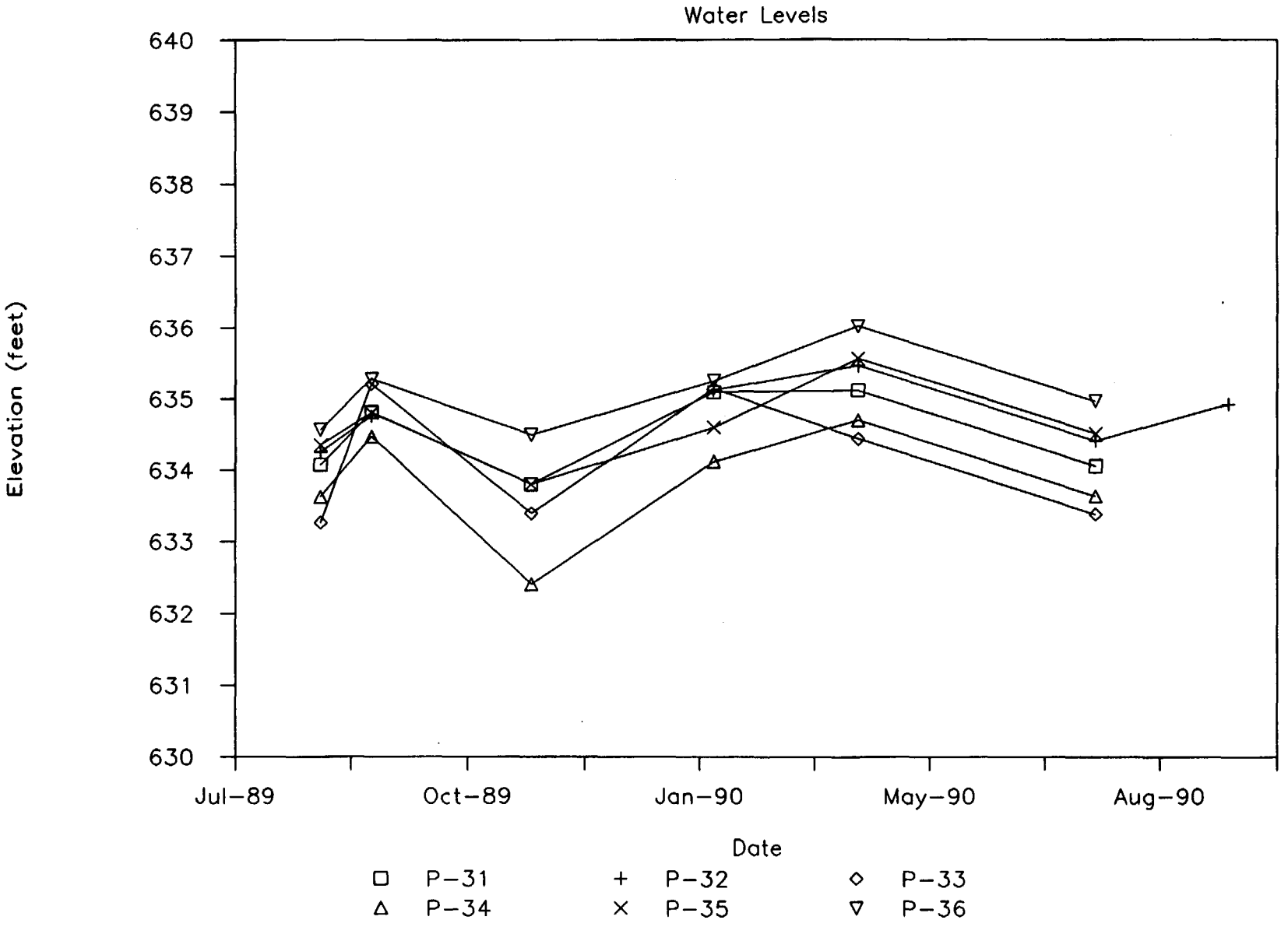
P-19 through P-24



P-25 through P-30



P-31 through P-36



P-37 through P-41